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ABSTRACT

This project was an experimental effort to study, analyze, and understand interlibrary networks. The immediate purpose of the project was to develop methodologies for evaluating or analyzing networks; the ultimate purpose was to provide planning assistance to network funders, designers or operators. The project was conducted in four simultaneous phases. The Conceptual Model (Phase I) considered components of network design and performance and identified thirteen significant operational parameters. The Behavioral Model (Phase II) simulated network operations through "game playing" and further confirmed the validity of the Conceptual Model. In Phase III an effort was made to quantitatively analyze interlibrary networks in a Metropolitan Area. Significant operational variables were identified and measured. A Node-Network Dynamics Grid was developed to assist in evaluation and analysis of the Pilot Model Data. An Analytical Operations Research Model was developed in Phase IV to provide network planners with a tool for netowk performance prediction as a function of design options. A generalized network model called Lib-NAT (Library Network Analysis Theory) was developed and is presented. The methodologies developed in this project have been used by several states for network planning or evaluation and seem to be valid when properly applied. (Author/NH)

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FINAL REPORT
OF
A LIBRARY INTER-NETWORK STUDY DEMONSTRATION AND PILOT MODEL
(Lib-NAT)

Performed on Contract
for the
TEXAS STATE LIBRARY

Under
Title III, Library Services and Construction Act

By
Southern Methodist University
With the Cooperation of
Texas Library Association, Reference Round Table
And Others

Prepared By:

Maryann Duggan,
Principal Investigator
September 15, 1969
Revised June 17, 1971

LI 003 772

PREFACE

The increased importance of interlibrary cooperation and library networks is evident to all concerned with improving library services. Each state library agency is legislatively charged with the responsibility of implementing Title III of the Library Services and Construction Act. Furthermore, under the Higher Education Act, academic libraries have been engaged in developing cooperative consortia. Preliminary experiences with these two types of cooperative effort indicated the complexity of this new dimension in library service. The work reported herein was started in 1968 with the intent of identifying significant operational parameters and planning methodologies for more effective interlibrary cooperative ventures. In essence, this project was an experiment in library network analysis and planning for one state, Texas.

Certain significant operational parameters have been identified and a methodology for analyzing these parameters has been developed and presented herein. The term "Lib-NAT" (Library Network Analysis Theory) has been applied to these methodologies. However, the reader should keep in mind that most of the experimental work reported herein was conducted during 1969/70. The findings of the now infamous Airlie House Conference on networks were not available. Each state was just implementing Title III projects and the evaluation of those networks was not available in 1969. The work of Dr. Edwin E. Olson on power budgets of network cooperatives had not yet started. The National Advisory Commission on Libraries' final report was not publicly available. However, in spite of the unfortunate time lag between experimental data collection and this final report, the principles of network design and analysis presented herein are believed to be valid today--and, possibly confirmed by the more recent national studies mentioned above.

The major overriding objective of this work has been to develop a generalized theory of network operation applicable to library cooperative ventures. In a sense, this goal was not achieved because no one concise, all-inclusive theory was evident. Instead, the findings indicate that library network and cooperative ventures are really very complex, new types of multi-dimensional systems with many components, i.e. organizational, financial, political, technical, and most of all--people. The findings reported herein just tap the surface of these entities and are really only a first step in exploring this new important aspect of library service. It is hoped that other investigators will follow these explorations and extend the Lib-NAT methodologies so that improved network design and operation will be the ultimate achievement.

Many people contributed many things to this study and they are appropriately credited in various parts of this report. However, the completion of this project would not have been possible without the continuous confidence and encouragement of Dr. Dorman Winfrey, Director of the Texas State Library. Because of his determination and insistence, the documentation of the project in this final report form was made possible. Without his determined effort to issue the final report, my own sense of inadequacy and failure on this project would have let the pieces lie in the file. In the process of synthesizing the final report, however, the pieces began to fit together and order began to be discernible. So, thanks to Dr. Winfrey, Lib-NAT--for better or for worse--is now in the public domain. Only the future will determine its true value. And that future--I am convinced--will be greatly influenced by the dedicated librarians who are currently working to improve library services for all mankind through networks. Hopefully, Lib-NAT will be as one candle lighting their path in the darkness of this new adventure. But, beware! The path is rocky and steep and incomplete.

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Dallas, Texas
December 31, 1971

SUMMARY

This project was an experimental effort to study, analyze, and understand interlibrary networks. The immediate purpose of the project was to develop methodologies for evaluating or analyzing networks; the ultimate purpose was to provide planning assistance to network funders, designers or operators.

The project was conducted in four simultaneous phases with each phase considering an aspect of interlibrary networks. The Conceptual Model (Phase I) considered components of network design and performance and identified thirteen significant operational parameters. The Behavioral Model (Phase II) simulated network operations through "game playing" and further confirmed the validity of the Conceptual Model. The Networking Game and a Networking Glossary were developed for use in the Behavioral Model. Additionally, the Behavioral Model served to identify significant human aspects of network operations that must be considered by network planners.

In Phase III (Dallas Area Pilot Model) an effort was made to quantitatively analyze interlibrary networks in a Metropolitan Area. Significant operational variables were identified and measured. A methodology for calculating node-network dynamics was evolved. Difficulties in data collection and processing were encountered but were overcome by modification of interpretation demands. A Node-Network Dynamics Grid was developed to assist in evaluation and analysis of the Pilot Model Data.

An Analytical Operations Research Model was developed in Phase IV to provide network planners with a tool for network performance prediction as a function of design options.

In an effort to synthesize and assimilate the experience and learning from these four phases, a generalized network model was developed. This model is called Lib-NAT (Library Network Analysis Theory) and is presented herein.

Certain recommendations are offered to the Texas State Library as possible guidelines for future network development in the state. These recommendations should be reviewed in context and are therefore not listed in this summary.

The value of this project remains to be determined. The methodologies developed in this project have been used by several other states for network planning or evaluation and seem to be valid when properly applied. Certainly, the investigator is now much wiser and less naive about networks! This report is an effort to communicate these experiences to those concerned with network planning, funding, and operation. The findings described herein are only the beginning steps in a long, difficult but exciting journey into the multi-dimensional world of interlibrary networks.

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I. INTRODUCTION

This is the final report of the work done under contract with the Texas State Library on the proposed "Library Inter-Network Study, Demonstration, and Pilot Model." A copy of the original proposal and contract letter are included as Appendix A.

This report is intended to supply complete documentation of the project from the initial proposal to the completion of the contract. Every effort has been made to include all official correspondence and written material* generated during the course of the project. Minutes or summaries of all significant meetings are also included to complete the documentation. Omissions as well as achievements are described since it is intended for this report to serve as a record of the failures as well as the successes of the project. The reader may select or omit portions of the report by using the Table of Contents to the body of the report and to the Appendix.

This report is a "history of a project" and, in that sense, the author hopes it will be of value to others interested in interlibrary network development. If any sections are not self-explanatory or if details are not clear, the author welcomes inquiries. Comments on any aspect of the work reported herein will be appreciated.

A. Purposes of the Project

The project reported herein was intended to achieve all the aims and objectives outlined on page 3 of Appendix A. In summary of these nine aims, the project was intended to develop guidelines for the development of a statewide interlibrary network in Texas. The particular situation in Texas (as of November 1968) was such that the planning and development of cooperative programs interfacing various types of libraries required appreciable study and analysis of the on-going 14 separate networks in the state. This project was intended to provide insight into the methods, requirements, and procedures for developing a statewide interlibrary network interfacing the different types of libraries and yet available to all citizens of the state.

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* As of September 1969.

B. Methodology Used in the Project

A variety of methodologies was employed at various phases within the project. In general terms, the methodology of modeling and simulation was combined with the methodology of observation, analysis, synthesis and hypothesis testing. A search for appropriate methods to achieve the stated purposes was one part of the project activity. Appropriate problem-solving methodologies combined with the scientific methods of deduction from experimentation and observation led to the development of a "generalized interlibrary network theory."

This "theory" was then "tested" in a "behavioral model" and "a pilot model." Observations and experimental data from this testing were then "fed back" to improve the original theory. Certain tools for analysis and demonstration of the theory had to be developed; systems analysis, symbolic modeling, mathematical modeling, and operations research simulation techniques were employed. In the behavioral modeling (to test the theory by "people participation") a networking game requiring role playing and conflict resolution was developed.

A brief explanation of "modeling" methodology might be helpful in understanding the project. Generally speaking, a model may be defined as the body of information about a system gathered for the purpose of studying the system. An accurate model must represent the system and mirror or map the effects of various changes in the original, enabling the original to be studied, analyzed, and understood by means of the behavior of the model.* Many types of models have been used in systems studies and may be classified in the following ways:

1. Physical
    a. Static
    b. Dynamic
2. Mathematical
    a. Static - numeric or analytic
    b. Dynamic - numeric or analytic

---

*Van Nostrand's Scientific Encyclopedia, 4th ed., 1968, p. 1628.

3. Behavioristic
    a. Static
    b. Dynamic

One of the frustrations of the project was the lack of a concise theory and methodology for explaining, analyzing, comparing, and developing interlibrary networks. Interlibrary networks are a complex, multi-dimensional system of sub-systems, operational components, services, and people. This project attempts to illustrate the application of various "problem-solving strategies" to interlibrary network planning, implementation, and development in the "real world" of Texas. Hopefully, the results of this project will provide a fundamental systems methodology (Lib-NAT) which can be generalized and applied to other real library worlds.

C. PERT Chart of the Project

A modified PERT* chart for the project is presented on the following page. This chart was constructed _after_ the project was completed and, thus, illustrates the "events" or "tasks" that were actually performed at the time and in the sequence of actual performance.** Those "tasks" marked with asterisks were not funded under the contract, although they were generated by the project and are reported herein as part of the project.

In broad terms, the project consisted of several simultaneous sub-projects, namely:

Phase I:	Conceptual Model
Phase II:	Behavioral Model
Phase III:	Dallas Area Pilot Model
Phase IV:	Analytical Operations Research Model
Phase V:	Lib-NAT--a synthesis of the four previous phases into a Library Network Analysis Theory
Phase VI:	Recommendations for network development in Texas.

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*Program Evaluation & Review Technique

**with the exception of the publication date of the final report.

Although, from necessity, these various phases are described in sequence, it should be emphasized that the separate phases were conducted simultaneously as illustrated in the PERT chart. The interaction of these various phases produced symbiotic, "iterative", heuristic benefits which resulted in an improved understanding of the total complex of interlibrary networks.

The following PERT chart should be helpful to the reader in following the project activities.

One final introductory note: This report has been organized so that the main text is really a guide to the Appendices which contain the real information. Each chapter is supported and explained by a separate appendix. Thus, when reading a chapter, the accompanying appendix should be reviewed before proceeding to the next chapter. The relationship between chapters and appendices is as follows:

When Reading Chapter:	Review Appendix:
I	A
II	B
III	C & F
IV	D & C.5(f)
V	C.5(h) and E
VI	F
VII	A.1 & G

The Glossary in Appendix C (p. C-45) should be helpful in reading all chapters.

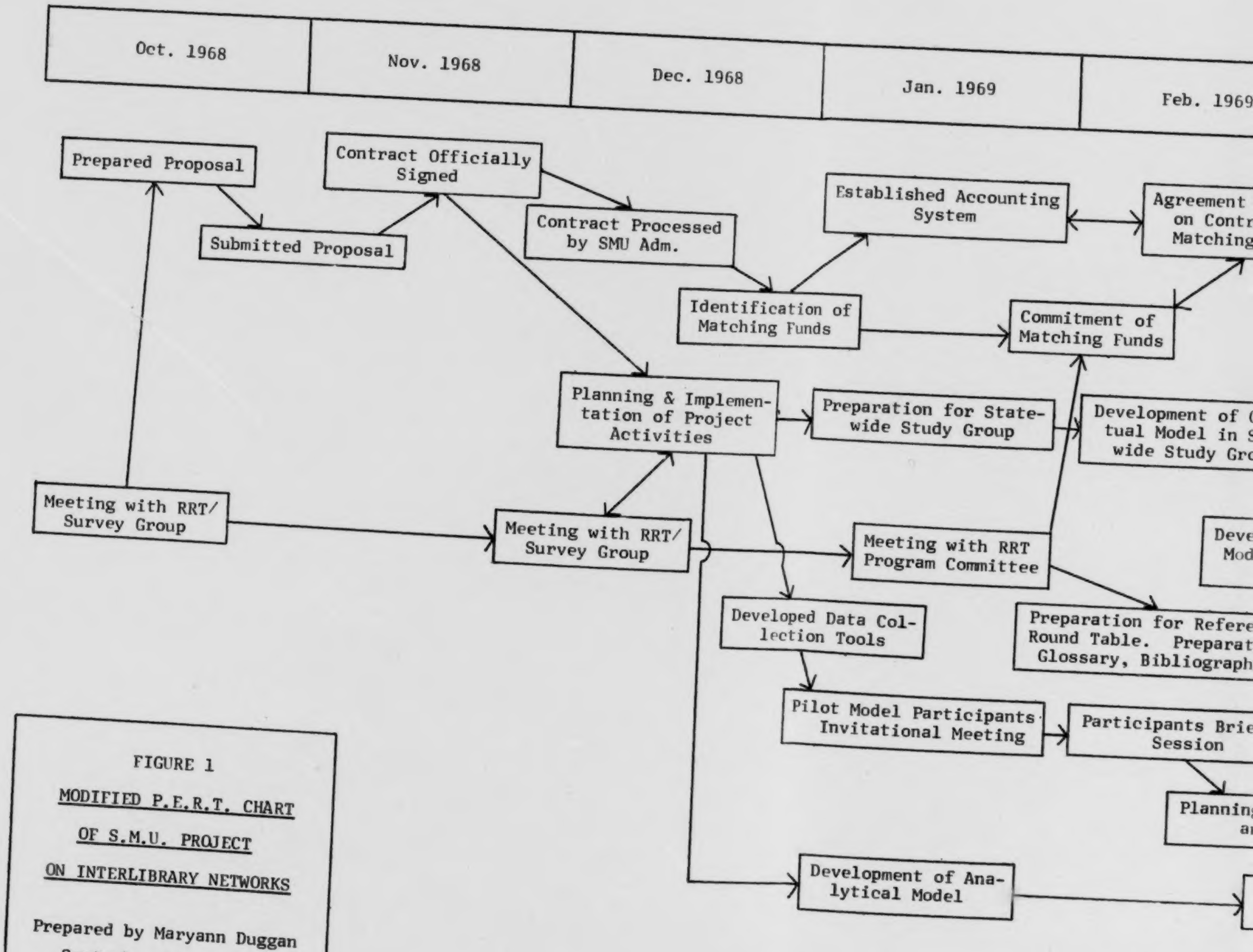

Oct. 1968
Nov. 1968
Dec. 1968
Jan. 1969
Feb. 1969
Prepared Proposal
Submitted Proposal
Contract Officially Signed
Contract Processed by SMU Adm.
Established Accounting System
Agreement on Contr Matching
Identification of Matching Funds
Commitment of Matching Funds
Planning & Implementation of Project Activities
Preparation for Statewide Study Group
Development of tual Model in wide Study Gro
Meeting with RRT/ Survey Group
Meeting with RRT/ Survey Group
Meeting with RRT Program Committee
Deve Mod
Developed Data Collection Tools
Preparation for Refere Round Table. Preparat Glossary, Bibliograph
Pilot Model Participants Invitational Meeting
Participants Brie Session
Plannin a
Development of Analytical Model

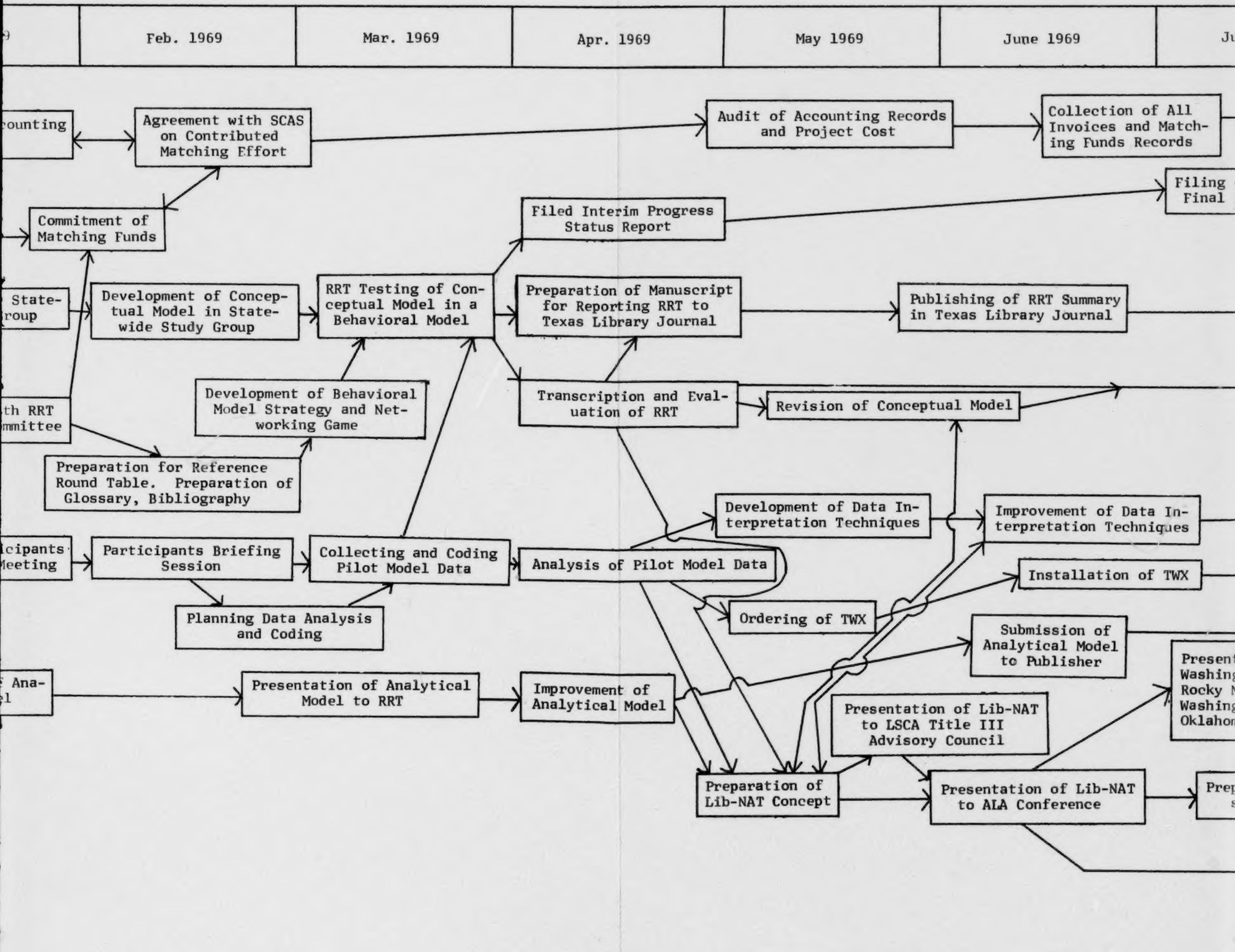
FIGURE 1

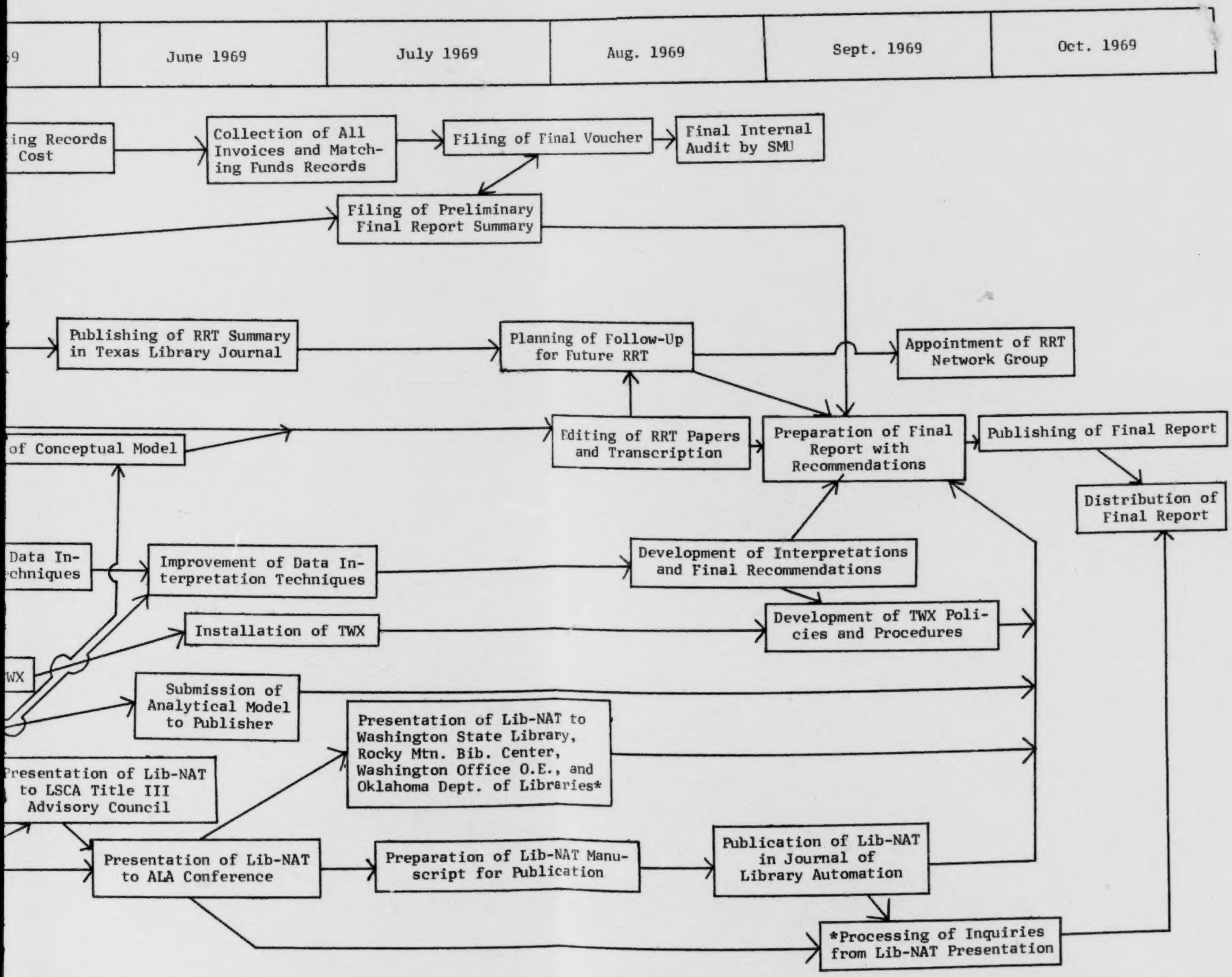
MODIFIED P.E.R.T. CHART

OF S.M.U. PROJECT

ON INTERLIBRARY NETWORKS

Prepared by Maryann Duggan
September 15, 1969


Feb. 1969
Mar. 1969
Apr. 1969
May 1969
June 1969
Ju
counting
Agreement with SCAS on Contributed Matching Effort
Audit of Accounting Records and Project Cost
Collection of All Invoices and Matching Funds Records
Filing Final
Commitment of Matching Funds
Filed Interim Progress Status Report
State-roup
Development of Conceptual Model in Statewide Study Group
RRT Testing of Conceptual Model in a Behavioral Model
Preparation of Manuscript for Reporting RRT to Texas Library Journal
Publishing of RRT Summary in Texas Library Journal
th RRT mmittee
Development of Behavioral Model Strategy and Networking Game
Transcription and Evaluation of RRT
Revision of Conceptual Model
Preparation for Reference Round Table. Preparation of Glossary, Bibliography
Development of Data Interpretation Techniques
Improvement of Data Interpretation Techniques
icipants Meeting
Participants Briefing Session
Collecting and Coding Pilot Model Data
Analysis of Pilot Model Data
Installation of TWX
Planning Data Analysis and Coding
Ordering of TWX
Submission of Analytical Model to Publisher
Ana-l
Presentation of Analytical Model to RRT
Improvement of Analytical Model
Presentation of Lib-NAT to LSCA Title III Advisory Council
Present Washing Rocky M Washing Oklahom
Preparation of Lib-NAT Concept
Presentation of Lib-NAT to ALA Conference
Prep s



9
June 1969
July 1969
Aug. 1969
Sept. 1969
Oct. 1969
ing Records
Cost
Collection of All Invoices and Matching Funds Records
Filing of Final Voucher
Final Internal Audit by SMU
Filing of Preliminary Final Report Summary
Publishing of RRT Summary in Texas Library Journal
Planning of Follow-Up for Future RRT
Appointment of RRT Network Group
of Conceptual Model
Editing of RRT Papers and Transcription
Preparation of Final Report with Recommendations
Publishing of Final Report
Distribution of Final Report
Data In-
chniques
Improvement of Data Interpretation Techniques
Development of Interpretations and Final Recommendations
Installation of TWX
Development of TWX Policies and Procedures
WX
Submission of Analytical Model to Publisher
Presentation of Lib-NAT to Washington State Library, Rocky Mtn. Bib. Center, Washington Office O.E., and Oklahoma Dept. of Libraries*
Presentation of Lib-NAT to LSCA Title III Advisory Council
Presentation of Lib-NAT to ALA Conference
Preparation of Lib-NAT Manuscript for Publication
Publication of Lib-NAT in Journal of Library Automation
*Processing of Inquiries from Lib-NAT Presentation

II. PHASE I: THE CONCEPTUAL MODEL OF AN IDEAL, STATEWIDE INTERLIBRARY NETWORK

The 1968 Reference Round Table* clearly identified the need for an overall state plan for interlibrary cooperation and network development. As a minimum, such a plan should include all types of libraries and should identify the functional elements necessary for logical network development.

The first phase of the work reported on herein was to develop a conceptual model of an ideal statewide interlibrary network that would provide all citizens of Texas effective access (in an orderly manner) to the library resources and services of the state.

The conceptual model would serve as an overall floor plan or "basic building block" on which to develop action programs.

A. Purpose

The purposes of Phase I were:

1. To cooperatively define basic elements, components and operational parameters of an ideal statewide interlibrary network--a conceptual model.
2. To survey current status of development of planning of various library networks within the state and to include these developments in the conceptual model.
3. To identify barriers to development of the ideal statewide interlibrary network and to explore ways of overcoming these barriers.

B. Methodology

Development of goals requires a dual process of analysis-synthesis. The analysis phase consists of determining present status via "fact-finding". The synthesis phase consists of developing concepts of short-term and long-term objectives. Both phases require the total participation of persons with statewide perspective and responsibility for statewide planning. A "round-table discussion" in an atmosphere of candid analysis and synthesis was the methodology selected for developing the conceptual method.

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*Texas Library Association Reference Round Table Pre-Conference Seminar Proceedings, 1968.

C. Procedures

The procedure followed in developing the conceptual model of the ideal statewide interlibrary network was as follows:

1. Involving Key Persons

Those persons responsible for statewide planning of library services and development were identified. These consisted of:

(a) Texas State Library - public libraries and administration of Library Services and Construction Act.

(b) Texas Education Agency - public elementary and secondary school libraries.

(c) President, Texas Junior College Library Division, Texas Junior College Association.

(d) Coordinating Board, Texas College & University System - public higher education system, college and university library planning.

(e) Heads of existing networks, namely:
   (1) WINA - Western Information Network Association
   (2) SETINA - Southeast Texas Information Network Association
   (3) TEMP - Texas Educational Microwave Project
   (4) TAGER - The Association for Graduate Education and Research
   (5) IUC - The Inter-University Council

(f) Council of Medical and Health Science Libraries

(g) Southwestern Association of Law Libraries

(h) Texas Chapter, Special Libraries Association

(i) Association of School Librarians

(j) Library Development Committee, Texas Library Association

(k) Reference Round Table, Texas Library Association

(l) Library Services and Construction Act, Title III Advisory Council

(m) Office of Education, Library Services Program Officer, Region 7

Official representatives of each of the above organizations were invited to participate in a Statewide Study Group to analyze the present status of library development in their area of responsibility and to synthesize a conceptual model of an ideal statewide interlibrary network. The official meeting of the Statewide Study Group was on February 18, 1969, at Southern Methodist University in Dallas. The full record of this meeting is presented in Appendix B.

2. Analysis Phase - Summary

The Statewide Study Group analyzed the existing situation during candid discussion at the February 18 meeting. These findings are summarized as follows:

> Existing networks seem to be developing independently with little, if any, coordination at the state level. There seems to be a need for a statewide "umbrella agency" to provide guidance in planning and development of interlibrary networks. The statewide survey conducted by Mr. Richard Waters indicated a need of definition of network characteristics or performance elements.* Dr. Richard Nance's presentation emphasized the need for definition of network "utility" and criteria for evaluation of performance of library systems. Further discussion indicated a need for distinction between "communication networks" and "library or information networks." The library network planners need to work closely with the communication network designers to insure maximum use of telecommunication channels being developed in the state.

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*Partially as a result of this meeting, the Texas State Library funded the development and publication of: Interuniversity Council of the North Texas Area. Directory of Information Networks in Texas. March 1971, 58 p.

The analysis phase raised many questions. Some of the questions concerned levels of switching between networks (i.e., local, regional, or state) and the availability of "locator files" or "switching centers." Questions were raised concerning criteria for use of networks for various patron groups and types of needs or levels of service. Concern was expressed that networks might be considered as a substitute for responsible development of local resources.

Questions regarding funding philosophy and pricing structure were discussed with emphasis on need for determination of economic value of library networks. It was agreed that valid cost data of library services are needed to provide guidelines for funding and planning.

3. Synthesis Phase - Summary

The Statewide Study Group identified the areas needing further development if a statewide interlibrary network is to be implemented in Texas. In summary, the conceptual model of an ideal statewide network would consist of certain components, both technical and organizational. These components constitute the conceptual design as described below.

D. Results

The Statewide Study Group achieved several missions. First, communication channels were opened between organizations and persons responsible for statewide network development. Secondly, an overview of various network developments in Texas was shared by all participants. Thirdly, needs and barriers were identified and freely discussed and relative priorities explored. The major result of this Study Group activity was the development of the conceptual model of an Ideal Statewide Interlibrary Network. This conceptual model consists of the following components:

1. Organizational Structure, providing for fiscal, legal, planning, policy formulation and requiring commitment, operational agreement and common purpose.
2. Collaborative Development of Resources, providing for cooperative acquisition of rare and research material and for strengthening local resources for recurrently used material. Multi-media resources developing is essential.
3. Identification of Nodes, providing for designation of role specialization as well as for geographic configuration.
4. Identification of Primary Patron Groups, providing for assignment of responsibility for library service for all citizens within the network.
5. Identification of Levels of Service, providing for basic needs of patron groups as well as special needs and identifying distribution of each service type among the nodes; must provide for "referral" as well as "relay"; for document transfer as well as "information transfer."
6. Legal Right of Access, providing fiscal, contractual, legal planning and policies.
7. Establishment of Bi-Directional Communication System, providing "conversational mode" format and designed to carry desired message/document load at each level of operation.
8. Common Standard Message Codes, providing for understanding among the nodes on the network.
9. Central Bibliographic Record, providing for location of needed items within the network.
10. Switching Capability, providing for interfacing with other networks as well as determining the optimum communication path within the network.
11. Selective Criteria of Network Function, providing guidelines of what is to be placed on the network.
12. Evaluation Criteria and Procedures, providing feedback from users and operators and means for network evaluation and modification to meet specified operational utility.

13. Training Programs, providing instruction to users and operators, including policy and procedures.

In summary, the so-called ideal statewide interlibrary network should be so designed that any citizen anywhere in the state can have access to the total library and information resources of the state through his own local library.

E. Evaluation and Conclusions

The above conceptual model is only an outline of the components necessary in developing the statewide interlibrary network. The Study Group could do little more in the available time* and within their designated areas of responsibility. The conceptual model is the skeleton plan around which the development can proceed. The questions of priorities, funding, and responsibility for implementation are still unanswered as of this phase of the project. Each of the thirteen components should be further explored and developed in detail by appropriate statewide network planners and the required implementation steps identified cooperatively by a continuing Statewide Study Group.

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*The Study Group officially met only once during the contract period.

III. PHASE II: A BEHAVIORAL MODEL OF LIBRARY NETWORKS

The conceptual model developed in Phase I was the product of the Statewide Study Group and represented the theoretical approach and administrative background of that group. Too often there is a "credibility gap" between theory and practice. This credibility gap can often result in failure of the best theories. Phase II of the project required the testing of the credibility and practicality of the conceptual model. The March 1969 Texas Library Assocation Reference Round Table Pre-Conference Institute provided an ideal medium for further testing and development of the conceptual model by use of a "behavioral model."

A. Purpose

The purposes of this phase were:

1. To test the practicality and credibility of the conceptual model within a behavioral model environment.
2. To participate in planning and development of an improved conceptual model.
3. To determine practicing reference librarians' attitudes and "state of readiness" for interlibrary networking.
4. To acquaint practicing reference librarians with the latest networking concepts and of local, regional, state and national network developments.

B. Methodology

In order to achieve the above purposes, the following methodologies were employed:

1. Simulated Network

The March 1969 Texas Library Association Reference Round Table Pre-Conference Institute was arranged physically and organizationally in a simulated network with each node (table) representing different types of libraries and different geographical locations.

2. Networking Game

Specific examples of "typical networking cases" were assigned to various nodes in the simulated network to determine attitudes and behavior patterns in networking situations through "role playing" as the cases were resolved.

3. Educational Objectives

Formal papers were presented to acquaint the reference librarians with recent developments in interlibrary networking. A glossary of networking terminology was presented, along with a bibliography of pertinent publications related to interlibrary network development.

4. Reactors

"Official Listeners" were designated to answer specific questions, to stimulate other questions, and to summarize the significance of the behavioral attitudes exhibited during the networking games.

5. Critique

Each registrant was given an opportunity to critique or participate in planning the conceptual model, both informally (through "role playing") and formally through completion of a written critique sheet provided.

C. Procedures

The procedures followed were to achieve total involvement of the March 1969, Reference Round Table Pre-Conference Institute of the Texas Library Association. The one-day program was planned around the theme of interlibrary networks for reference services. Formal papers were interspersed with networking questions "to be handled" by the conference participants as in the real world. In order to enhance this involvement and participation, the conference room was physically arranged as a network, by using 24 round tables. Each table represented a "node" in the Texas Network, either by type of library, geographic location, or existing networks previously identified.

To further enhance participation by the attendee, a pre-conference packet was mailed to each advance registrant. A glossary of networking terms, the networking problems, and the elements of the conceptual model were included in the advance packet, along with the bibliography on networking developments.

Appendix C contains the details and description of the Reference Round Table simulated behavioral model. All details of registered participants, program, room arrangement, networking cases, official listeners, formal papers, and transcription of the behavioral model are presented in Appendix C.

D. Results

A total of 288 reference librarians registered for the Reference Round Table Pre-Conference Institute. It is difficult to quantitatively measure human behavior and attitudes; however, the observation of the simulated network behavior and an analysis of the transcription of the "networking game" provide certain insights helpful to network planners. These are summarized as follows:

1. Testing of the Conceptual Model

The networking game was so designed to produce "forced choice" and "free choice" decision making of each participant playing the game. In this manner, the playing of the game reflected the player's "real-world" orientation regarding their concept and resulting practices in networking in Texas. All thirteen elements of the conceptual model were validated as significant factors in the daily operation of the network as evidenced by the participants' behavior in the game-playing.

Each situation in the networking game was designed to simulate a real-life situation involving one or more of the thirteen conceptual network components. The behavioral variables in each question involve the following decisions:

a. What is the nature of the information need?
b. What is the appropriate source?
c. What is the appropriate route of access?
d. What is the procedure for finding the source and route?
e. What is the nature or "qualification" of the requestor?
f. Who pays for the service?

2. Participatory Planning and Development of an Improved Conceptual Model

(a) Improvements Based on Observations:

The role-playing emphasized the need for further understanding of networking principles. The "rules of networking" have not been clarified, and each case resulted in generating questions of policy as well as procedure. The cases emphasized the importance of "locator files" and the acute need to "know resources." "Personal contact" was the first suggested method for knowing resources; the use of a formal "locator file" or switching center was apparently not an entrenched habit. The cases also generated agreement on the need for "selectivity criteria," i.e., guidelines on what types of requests to put on the network, and for which patrons are networks designed.

(b) Improvements Based on Formal Critique:

Each of the 288 participants were provided with a critique sheet soliciting additions to or deletions from the conceptual model of the ideal network. Only four critique sheets were completed and returned. These encouraged the (1) building of local resources through cooperative acquisitions, (2) avoidance of over-dependency on the network by strengthening local resources in a planned manner, (3) development of bibliographic center or locator files to enhance the filling of document transfer requests, (4) formulation of "selectivity criteria" and need for uniform policy decisions on whom will be served, (5) assumption of responsibility for all library service by each type of library for their designated primary patron group.

3. Determination of Attitudes and "State of Readiness" for Interlibrary Networks by the Practicing Reference Librarians

Based on observation of case-handling and analysis of the transcription of the behavioral model, the reference librarians attending the Institute have a willing but cautious "state of readiness." Some of the potential benefits from interlibrary networks are recognized but the full impact of the statewide network concept was not totally realized or applied in the case handling. Adherence to the traditional "routes of access" was predominant in the responses to the cases; however, most participants were willing to try new routes when such were offered. Some means of continuous training in networking concepts must be devised if the full benefits from interlibrary network systems are to be realized, or if these new systems are to operate effectively.

An interesting (and unexpected) reaction was the overt concern by many of the participants that (1) they were assigned to the "wrong" node, or (2) they were not giving the "right" answer. These attitudes and concerns are obvious in reading the transcription.

In general, the predominant attitude was one of "cautious and uncertain willingness" with implied recognition that library networks are coming--ready or not!! The value system of the group was such that group recognition and acceptance were high for intellectually rewarding "breakthroughs." Library-network development--and all this term implies--is intellectually challenging and appealing to this group. This group characteristic offers the opportunity for the personal involvement of reference librarians of Texas in network development. Their concern for "right answers" implies a feeling of uncertainty but a desire to learn the "rules of networking."

E. Evaluation of and Conclusions from Phase II:

The "networking game" proved to be an effective method for stimulating thinking, gaining participation, and demonstrating attitudes and current practices in the complexities of interlibrary networks. The open and candid responses reproduced in Appendix C are evident in the transcription of the networking game.

Based on this behavioristic model, it is concluded that:

1. The conceptual model of the ideal statewide interlibrary network is fundamentally and theoretically valid.
2. Refinement of the 13 elements of this conceptual model should be initiated by statewide planners. Definitive implementation steps and strategy for development of each element will be required to evolve a viable program.
3. The "operators" of such a network (i.e., the reference librarians) are cognizant of the challenge these new systems offer and are eager and willing to be educated on the policies, procedures, theory, and applications, and to participate in the planning of such a network. A certain amount of "rigidity" and "let others do it" attitudes were apparent but these barriers can probably be overcome by adequate training and motivation.

Based on the analysis of the networking game as presented in Appendix C.6(b), the additional conclusions seem valid:

1. Routes of access are not well defined and potential options are not clarified.
2. Following a pre-structured homogeneous vertical network is "easy" to do but does not yield a high percent of favorable results.
3. Local switching capability in metropolitan areas is needed.
4. Resources of special libraries need to be better identified.
5. Heterogeneous type transactions (i.e., involving more than one type of library) are the most frequent and most successful in meeting objective yet adequate switching mechanisms are not provided.
6. The networking game has real potential for analysis and understanding of interlibrary networks.

IV. PHASE III: DALLAS AREA PILOT MODEL OF INTERLIBRARY TRANSACTIONS*

The designing and planning of interlibrary networks in Texas must consider existing patterns of interlibrary cooperation and existing methods of "interfacing" between types of libraries. Interlibrary loans are a basic example of on-going interlibrary cooperation, and are the first "service level" of an interlibrary network. The Dallas Metropolitan Area offers a cross-section of different types of libraries with varying network relations. The on-going interlibrary loan transactions between and among these libraries and the "outside world" should provide insight to the further development of interlibrary networks of various types of libraries at the state level.

A. Purposes

The purposes of this phase were:

1. To examine microscopically and quantitatively on-going interlibrary loan transactions in the Dallas area to achieve insight and understanding applicable to interfacing library networks of varying types at the state level.
2. To develop appropriate methodology for examining, analyzing, and interpreting the interlibrary loan transactions in a typical sample of all types of libraries in the Dallas area.
3. To synthesize a strategy for interlibrary loan analysis and interpretation that could be generalized to other areas of the state and would be of assistance to interlibrary network planners at the state level.
4. To compare the actual interlibrary loan activity with elements in the conceptual model (Phase I) for further testing of the validity of the "ideal network."

B. Methodology

Generally, used methodology of observation of a sample, quantifying the observation, analyzing the data and generalizing on the findings.

1. The data collection methodology used in this phase consisted of pilot modeling technique based on sampling "typical libraries" and further sampling a time interval of interlibrary loan activity prior to the pilot model period.

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*Also see the descriptive paper on this study which is reproduced as Appendix C.5f.

2. The data analysis methodology consisted of identifying significant variables and developing quantitative (a symbolic model) tools for expression of these variables as extracted from the data.
3. The interpretation methodology consisted of developing generalizable modes of displaying the quantitative variables so that certain "operational parameters" can be evaluated and compared within the pilot model sample, enabling the formulation of specific conclusions about existing operation parameters.

C. Procedures

The following procedural steps were followed:

1. Identification and selection of participating libraries. The libraries selected for participation are listed in Appendix D. Each library selected represents a "type" of library as indicated in the listing.
2. Commitment of Participating Libraries
   The selected libraries were invited to a "briefing luncheon" and were officially invited to participate in the pilot model. Formal commitment forms were distributed for officially signifying willingness to participate and supply data. The list of the "committed" libraries and sample forms are enclosed in Appendix D.
3. Data Collection Procedure
   Forms for collecting interlibrary loan transactions data were developed and are presented in Appendix D. In a briefing session with the participating libraries, certain definitions and policy decisions on data collection details were developed in order to achieve maximum uniformity of the data elements. These are described in Appendix D. Each participating library

was to collect[*] the data required on the forms and submit the completed forms to the investigator.

4. Data Code Procedure

   The "raw data" as collected above required sorting and re-arranging in order to analyze and compare the data elements and the significant variables in the pilot model. Modern data processing via computer techniques seemed to offer the most effective means of "processing" these raw data. On a cooperative formal agreement with the Southwest Center for Advanced Studies (SCAS), competent data processing and computer assistance was promised. The code system used to "normalize" the raw data for input is described in Appendix D. The input format for each data point is also presented in Appendix D. The investigator, with the assistance of the SCAS personnel, attempted to code the raw date for computer input in an effort to achieve reasonable consistency in the interpretation required for data processing.

5. Data Analysis Procedures

   The significant variables of importance to understanding interlibrary networks from the pilot model were identified in a series of discussions with the participating libraries, with other interested persons, and from a review of the literature on interlibrary loan practices. These variables are listed and described in Appendix D. A total of possible permutations could have been compared; however, for the purpose of this pilot model, the "type of library" was considered the control constant and the other data elements were considered as the variables. Tabular and graphical displays were developed to illustrate the data elements in the various significant combinations.

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[*] See "RESULTS" section for explanation and discussion of problems and exceptions to this data collection procedure.

At the time of the data analysis phase, a search of library literature indicated no prior published work of exactly this type. Thus, there were no previously designed standard procedures to follow in developing the data analysis and interpretation techniques. Those reported herein "evolved" as the data analysis phase continued.

6. Data Interpretation Procedures

Criteria for data interpretation were developed as the data analysis progressed. Means of interpreting the significant variables in a quantitative method were explored. Where applicable, standard statistical techniques were used to illustrate significant relations. Interpretations of the significance of some of the data configurations were based on a framework of the conceptual model (Phase I). Certain hypotheses of the conceptual model were "tested" against the pilot model data.

Again, the absence of any previously established quantitative criteria for evaluating interlibrary loan performance among various types of libraries required the evolutionary development of the interpretation phase.

D. Results

The results of this pilot model are summarized below. As explained in Appendix D, only the most general conclusions can be considered valid due to poor design of the testing instruments and inadequate data analysis.

1. A relatively small number of the 17 participating libraries engage in a significant volume of interlibrary loan activity. Over 80 percent of the total reported activity was conducted by only five of the libraries.
2. Sixty percent of the participating libraries borrowed more than they loaned. Seven-seven percent of the borrowing originated from the special libraries. Of the borrowing originating from the participating libraries, 73 percent was filled by the academic library community.
3. The highest volume of borrowing was between special/academic, followed by academic/academic. Sixty-six percent of the borrowing involved a transaction between two different types of libraries.
4. The public libraries accounted for four percent of the borrowing in the sample. School libraries reported no borrowing transactions.
5. Over half (52 percent) of the items borrowed were located in Dallas County. Eighty percent of the requested items were obtained from within Texas.
6. Telephone was the access route used for 51 percent of the requests; TWX or Telex was used for 20 percent of the requests.
7. The total sample of reporting libraries requested 696 items and were asked for 840 items, demonstrating a "node dependency coefficient" of 0.45.
8. As lenders, the participating libraries were able to fill 63 percent of the items requested. The special libraries filled 96 percent of the items for which they were asked; the public libraries filled 21 percent of their requests. A total of 310 unfilled requests was processed by the participating libraries. Of the 189 Telex messages processed by the public library, 80 percent were not filled due to inadequate collection or "other" reasons.
9. As lenders, the participating libraries served as a state resource more than as a local resource since 64 percent

of the requests originated out of Dallas County. Fifty-two percent of these requests were transmitted by TWX or Telex; telephone was used for 22 percent of the requests.

10. The largest volume of lending transactions did not involve a mix of types of libraries; 81 percent of the lending transactions were among libraries of the same type.

E. Significance of Pilot Model

In many ways, the Pilot Model phase of this project could be considered a failure. The Pilot Model was inadequately planned and designed. The data collection instruments were not pretested and were apparently confusing to participants. Encoding of data for computer processing proved to be an insurmountable obstacle. Identification of significant variables was not sufficiently precise. Computer analysis of the data was not successful due to a variety of reasons. Continuation of the analysis techniques developed in the Networking Game (Appendix C.6-b) was not possible due to inadequate data processing capability. Evaluation criteria were not established for comparative or interpretive purposes. Yes, in many ways the Pilot Model was a failure.

In spite of these very valid criticisms, the Pilot Model does make several contributions to the understanding of interlibrary networks. These are:

1. Performance data now exist for comparative purposes for others to use in similar studies.
2. A methodology of analyzing node-network dynamics was developed and proved to have merit in network understanding.
3. Certain performance parameters were identified as needing improvement for the benefit of all users of interlibrary networks.
4. Future investigators will now know what not to do in future Pilot Models.

V. PHASE IV: ANALYTICAL (OPERATIONS RESEARCH) MODEL

Designing interlibrary networks requires rigorous analysis of functions, identification of elements, and synthesis of components in an optimum manner for the purpose of maximizing some previously defined "utility".* This type of approach to systems design is amenable to operations research techniques, particularly linear programming and simulation via analytical/mathematical modeling.

Dr. Richard Nance's presentation at the Reference Round Table (Appendix C.5, Item H) proposed an analytical model for simulating document and message transfer in a network. Since the initial presentation, Dr. Nance has prepared a less mathematical "overview" of simulation applications to interlibrary ventures. This "overview" is presented as Appendix E.

The use of operations research techniques for interlibrary network design and evaluation does appear promising. The systematics of operations research techniques requires a rigor in defining network parameters; this rigor in thinking out the operational elements of contemplated interlibrary networks is of benefit to the design of effective networks. Actual mathematical simulation will require the development of complex algorithms if all aspects of network performance are to be considered and modeled. The relating of operational aspects of interlibrary networks to mathematical simulation for evaluation of various design alternates will require appreciable research and development. The specific areas needing further development are detailed in Section VIII. Until such time as the algorithms and other techniques are fully developed, specific answers to network design cannot be obtained in a mathematical simulation. However, the work done on this project does illustrate the semi-quantitative benefits that can be derived from the application of operations research thinking to the design of interlibrary networks. The following section on Lib-NAT illustrates specific semi-quantitative applications of various operations research techniques for network design.

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*See Glossary in Appendix C for definition of unfamiliar terms.

VI. PHASE V: Lib-NAT*; LIBRARY NETWORK ANALYSIS TECHNIQUE

The previous sections of this report have described the various phases of the project. In summary, Phase I was the development of a conceptual model of an ideal statewide interlibrary network. Phase II was a behavioral model in which the conceptual model was "tested" in a simulated network by role-playing during the Texas Library Association Reference Round Table Pre-Conference Institute.** Phase III consisted of a pilot model during which ongoing interlibrary loan transactions among a group of different types of libraries were observed, analyzed, and interpreted in view of networking concepts. During Phase III, a variety of analytical techniques were developed to permit the display and interpretation of the pilot model data. Phase IV was the application of operations research techniques (and linear programming simulation) to the design and evaluation of library networks.

Each of these phases could be considered independent activity--each self-contained and complete within the scope of the individual phases. However, each phase does relate to all the others in that each phase is an essential approach to development and design of interlibrary networks. Synthesizing the four separate phases into a whole--into a logical approach to network design--was the objective of Phase V, reported in this section.

Phase V consists of evolving a total approach to library network analysis employing and combining the four methodologies and findings described in the previous four phases, in combination with another methodology: symbolic modeling. To give this total approach identity, it is called "Lib-NAT*: Library Network Analysis Theory."

Lib-NAT was first presented at the American Library Association joint meeting of Reference Services Division, Information Science and Automation Division, and Resources and Technical Services Division on June 25, 1969. A summary of Lib-NAT was published in the September 1969 issue of Journal of Library Automation at the invitation of the editor. A reprint of this article is enclosed as Appendix F.

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*"Lib-NAT" as an acronym evolved from the acronym of "Lib-NET" used by Mr. Carl Peters for the data analysis phase of the pilot model.

**Analysis of the results of the Networking Game led to a technique for classifying types of network transactions, thereby giving insight into need for interfacing of different types of libraries.

Lib-NAT is an effort to present a total approach (using new methodologies) to the design and analysis of interlibrary networks--a generalized interlibrary network theory. The value of Lib-NAT can only be determined by testing and application in the real library world with real data in different interlibrary systems. The detailed description of the various phases of Lib-NAT in the various sections and appendices of this report is intended to make the Lib-NAT approach available to others concerned with designing and improving interlibrary networks. Through such testing, the true value of Lib-NAT (and the work leading to Lib-NAT) can be evaluated in relation to achieving the goals of Title III of the Library Services and Construction Act.

VII. PROJECT COST ANALYSIS AND EVALUATION

A. Budget vs. Actual Costs

The proposed budget for this project is presented in Appendix A.1. These data represented the "best guess" of the cost of doing the work outlined in the Proposal dated November 4, 1968.

Now that the project is completed, actual cost data are available for review and for comparison with the proposed budget. The actual cost data* are presented in Appendix G by budget line item. The source of the matching funds, i.e. institutional or "contributed", is also indicated. Southern Methodist University was reimbursed the $11,000 federal funds as agreed in the contract.

The purpose of providing these cost data is to complete the documentation of the project in this report for the benefit of others planning similar projects. The comparison of anticipated expenditures (proposed budget) with actual expenditures indicates:

1. Salaries estimates were about correct, although slightly low.
2. Consultant costs were much greater than anticipated.
3. Committees, Workshops line item was overspent, partially because this line item was used to "collect" the bulk of the contributions of the Reference Round Table, the Statewide Study Group, and the Dallas Pilot Model participants, and partially because the cost of holding these meetings was greater than anticipated.
4. Travel costs were less than anticipated (partially because some travel costs were combined with travel for other projects, and therefore, the full cost was not charged to this project).
5. Communications costs were less than anticipated because the TWX-Telex units were not installed until late in the project. Also much of the cost of long distance calls was absorbed by participants in the program other than SMU.

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*As of June 1969.

6. Supplies and printing costs were greater than anticipated because of unforeseen volume of printed material required (witness the Appendices to this report!!)
7. Rent/Purchase of Equipment was less than anticipated due to the lag in processing the TWX and due to the donation of computer facilities and to the coding of rental equipment used in committees and workshops to that line item rather than to this line item.

Two last remarks on costs and related fiscal affairs:

1. If matching funds are to be identified from contributed salaries, services, expenditures, etc. of other co-sponsoring organizations, full documentation and accounting assistance is essential and should be arranged in advance.
2. Costs are almost always greater than anticipated and more salary and other expense will be required due to the complexities of interlibrary activity and the necessity for working with so many groups, etc., outside the sponsoring organization.

B. Benefit/Cost Analysis

The ultimate financial evaluation of a project requires a factual benefit/cost analysis. Again, this quantitative evaluation is difficult to develop. How can a dollar value be computed for the "benefits" of a project of this nature??

Disregarding all benefit aspects of the project other than the behavioral model, the following benefit/cost computation might be one way of quantitative evaluation:

Fact: Total Federal Dollars Spent in Total Project = $11,000

Fact: 288 Reference Librarians Participated for a Lapsed Time of 7 Hours Each in the Behavioral Model

Assumption: Each of the 288 Reference Librarians "learned enough" to improve their value as librarians by an assumed amount of $50.00 each.

Therefore: *The Behavioral Model alone* provided $50.00 x 288 = $14,400 benefit value for the *total* $11,000 federal funds spent on the *entire* project, or $1.40 benefit for each $1.00 federal cost.

Disregarding all benefit aspects of the project other than Lib-NAT, the following additional benefit/cost computation might be one way of quantitative evaluation:

Fact: Total Federal Dollars Spent on Total Project = $11,000

Fact: Sixteen libraries (see Section VIII) have specifically inquired regarding Lib-NAT *and* an estimated 1500 librarians heard the oral presentation of Lib-NAT at ALA in June 1969, *and* approximately 2000 librarians have read the Lib-NAT article in the September 1969 issue of *Journal of Library Automation*.

Assumption: Each of the 16 libraries will *save* at least $1,000 of their staff time in developing Lib-NAT concepts "from scratch" *and* each of the 2000 librarians reading the article will benefit by at least $100 in improved library performance.

Therefore: *Lib-NAT alone* provided 16 x $1,000 = $16,000 plus 2,000 x $100.00 = $200,000, or a total of $216,000 benefit value for the total $11,000 federal funds spent on the entire project, or $19.6 benefit for each $1.00 federal dollar spent.

The author recognizes that the above are *only* assumptions and welcomes suggestions on more factual methods for computing benefit/cost analysis. For example, perhaps the *real* benefit of a project of this type is the ultimate improvement in library and information services for the nation's needs through cooperative networks. By mobilizing total library services and resources to meet the diverse and critical needs of industry, education and students, local and state governments, each dollar spent on separate library service may do "triple duty", thereby enhancing the benefit/cost ratio of *all* library programs.

VIII. EVALUATION, CONCLUSIONS AND RECOMMENDATIONS

A. Evaluation

It is difficult to quantitatively evaluate a project of this type. Evaluation, therefore, must be subjective based on criteria generally acceptable for measurement of professional achievement. Following these guidelines, it is believed that the project:

1. Considered significant issues in developing improved interlibrary networks in Texas.
2. Involved appropriate persons at all levels in the development of network design concepts.
3. Followed reasonably valid scientific methodology in each phase.
4. Developed an innovative approach (Lib-NAT) to network analysis and design which can be generalized to other states or regions concerned with network development.
5. Stimulated thinking about basic concepts in interlibrary cooperation and emerging networks.
6. Made a worthy contribution to the Texas State Plan under Title III, LSCA (see "Recommendations" below).
7. Fulfilled the commitment to disseminate the procedures and results through professional media.

Admittedly, all the initial proposed goals and achievements were not accomplished. These failures were partially due to:

1. Poor or inadequate project planning, management, and staffing.
2. Shortage of time for implementation and completion.
3. Unforeseen barriers due to psychological and personal resistance to the project objectives.
4. Lack of adequate funding (local, state, and federal) particularly the matching funds requirement, to accomplish the magnitude of tasks proposed.

5. Lack of guidelines or previously established procedures or patterns to follow; i.e., the experimental nature of the project, requiring frequent revision in plans and programs.
6. The necessity of working with many different persons in groups and individually, thereby requiring extensive and unforeseen communications and coordination.

If the project can be considered in the total perspective of its contribution, perhaps the following quotation* provides applicable criteria for evaluation:

> "It is axiomatic in science that every opportunity for generalization is an opportunity for progress . . . Every model is of course an analogy. What makes a model (a project?) heuristically valuable is that it is treated as a point of departure, not arrival."

Thus, the true evaluation of this project will be determined by the future influence of the results on interlibrary cooperation and library development in Texas.

Perhaps an indication of the value of this project can be surmised from the interest expressed in the project's procedure and findings by library leaders in other states. Since the presentation** of Lib-NAT at the American Library Association conference on June 25, 1969, inquiries have been received from:

> Washington State Library (Olympia), Oklahoma Department of Libraries (Oklahoma City), Rocky Mountain Bibliographic Center (Denver), Wayne State University (Detroit), Western New York Library Resources Council, Hampshire College (Amherst, Mass.), Louisiana State University (Baton Rouge), Saint Louis Public Library, State of Wisconsin Division for Library Service (Madison), New York State Library (Albany), Purdue University (Lafayette, Indiana), University of Wisconsin Library School (Madison), University of Southwestern Louisiana (Lafayette), Black Gold Library Cooperative (Ventura, California), Vassar College Library (Poughkeepsie, N. Y.), and individual librarians in Minnesota, Illinois, and Canada.

The dissemination of the project findings is an integral part of the project, and copies of this final report will be distributed accordingly. Again, the evaluation of the project can best be measured by the validity of its findings in these other states and library systems as determined by application and testing.

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*Berrien, F. Kenneth. General and Social Systems. New Brunswick, N. J., Rutgers University Press, 1968. p. 204.

**As of September 1969. Since that time and as of June 1971 Lib-NAT has been used by Colorado, Ohio, Minnesota, Indiana, and Kentucky for planning purposes.

B. Conclusions

The following are offered as the major conclusions resulting from the various phases of this project:

1. The conceptual model is essentially valid and realistic. Therefore, if statewide interlibrary cooperation is to be achieved at optimum capability, implementation of the conceptual model should be initiated at an early date.
2. The behavioral model effectively documented the current attitudes and "state of readiness" for interlibrary networks in Texas. Based on these findings, programs of continuing education for the librarians of the state will be necessary for the development of the day-to-day skills and attitudes essential for the successful operation of interlibrary networks.
3. The Dallas area pilot model demonstrated the need for improved interlibrary services, the dependency of smaller libraries, and the inter-dependency of all libraries in the area.
4. The analytical model emphasizes the real and potential benefits to be derived from the use of operations research techniques in planning and evaluating library networks. Further refinement of these techniques will be required if valid, specific design questions are to be answered. In the interim, the techniques of operations research provide semi-quantitative guides of value in network design.
5. Lib-NAT, the synthesis of a general theory concerning library networks, emphasized the need for a new approach (and new problem-solving methodologies) in the development of interlibrary networks. The apparent acceptance of

Lib-NAT by library leaders from various states indicates a seeking for workable new approaches and re-emphasizes the critical lack of viable theories or guidelines in interlibrary network development. Lib-NAT does offer heuristic benefits; the true value of Lib-NAT can only be determined by further testing in different library systems.

6. Projects of the magnitude of the one reported herein require skilled project management, adequate funding, and appreciable time for activities and successful implementation--in view of the unforeseen difficulties and the necessary involvement of many persons.
7. The cooperative spirit of most of the libraries in Texas is a vital factor in future development of interlibrary networks. The libraries of Texas are eager to "get involved" and to participate and to be innovative--provided the leadership is sufficiently dynamic and charismatic!! The service potential of the libraries of Texas can be developed to the benefit of all citizens through the cooperative application of Lib-NAT at all service levels.

C. Recommendations

Based on the above conclusions and other findings of this project, the following recommendations are offered. It was the intention of this project to develop practical guidance for the improvement of interlibrary cooperation in the state. These recommendations are, therefore, offered as the ultimate value of the project to the sponsor--the Texas State Library.

1. A review of the 13 network components identified in the Conceptual Model should be undertaken with the intent of clarifying policies and procedures on network operations for Texas. The transcription of users' opinions on network design (in Appendix C.6) should be helpful in this review.

2. An analysis of the transcription of the Behavioral Model (Appendix C.6) should be undertaken to identify specific behavioral barriers, policy and procedural questions and levels of understanding on network use. Appropriate workshops should be held throughout the state to improve skills in network utilization. The Networking Game is a good tool for this.
3. A review of the quantitative data presented in the Dallas Pilot Model section (Appendix D) should be undertaken with the objective of improving the situation. Quantitative criteria for fulfilling network roles could be established, such as processing a certain number of requests at a fill rate of a certain percent. The reasons for the high number of unfilled requests being received over Telex should be reviewed with the objective of achieving an 80 percent fill rate. The cost of processing unfilled requests should be determined so that the cost of remedial steps can be evaluated. The routes of access, levels of switching, and uncertainty of location demonstrated in the analysis of the Networking Game (Appendix C.6-b) should be reviewed to assist in improving network performance.
4. An evaluation of possible means of identifying resources at the state level should be considered. The data indicate that location of resources is the major barrier to successful interlibrary loan transactions. Some simple yet effective method (such as the "LNR: Numerical Register of Books in Louisiana Libraries") should be evaluated for Texas needs. Closed, homogeneous networks apparently do not provide as effective a fill rate as do horizontal, heterogeneous open networks. Criteria for local switching in metropolitan areas can perhaps be established, based

on total available resources and the number of requests processed or transmitted at the geographic node. If the total library resources of the state are to be accessible, development of local switching capability in metropolitan areas is believed to be essential.

5. A plan for officially continuing the Statewide Network Study Group should be developed. Some state-level coordination of the various types of library networks is essential for optimum network performance.
6. Quantitative modeling and evaluation of interlibrary networks is a task of considerable magnitude and probably beyond the scope of any one state. And yet, each state is trying to perform this function in a vacuum of criteria or procedures. It is suggested that state library agencies urge that a national task force be appointed, funded, and charged with the responsibility of developing national network performance criteria and evaluation methodology

IX. ACKNOWLEDGMENTS

The work reported herein would not have been possible without the assistance, cooperation and support of dozens of persons and organizations. If any benefits are to be derived from this work, it is due to those who helped in the project; any errors or sins of omission or commission can be credited only to the principal investigator. Particular acknowledgment and appreciation are expressed to the Texas State Library (and specifically to Mrs. Marie Shultz) who had the faith and insight to sponsor this work as part of the Texas State Plan under LSCA Title III. A personal note of appreciation goes to Miss Janice Kee (Library Programs Service Officer, Region 7, U. S. Office of Education), who provided both moral encouragement as well as stimulating insight at just the critical moments in the project.

Others also made contributions in various ways. In Phase I, the following contributed time, ideas and support:

Mrs. Virginia Brannen
Mr. Richard Waters
Mr. Richard Perrine
Miss Janice Gohmert
Mrs. Flora Wilhite
Mr. Ross Peavey
Mrs. Mickey Boyvey
Mrs. Catherine Franklin
Mrs. Dorothy Sinclair
Mr. Edward Montgomery
Miss Ammarette Roberts
Col. Stanley Reiff
Mr. Truman Cook
Mr. Jim Stephens

In Phase II, the entire Texas Library Association Reference Round Table made contributions through the Networking Game. Specific appreciation is expressed to Miss Maxine Johnston, Chairman, Reference Round Table, to all the "official listeners" including Mr. Heartsill Young, Miss Jan Wolford, Dean Stanley McElderry, and all the program participants, including Dr. Ed Holley, Mr. Richard Perrine, Mr. Richard O'Keeffe, Miss Margaret Morris, Dr. Richard Nance, Mr. Wallace Olsen. Miss Carole Johnson, RRT Secretary Treasurer, and Mrs. Ruby Weaver, RRT Local Arrangements Chairman, deserve particular recognition for their extra efforts. Mr. Richard Waters' skill as "leader" assured the success of the game-playing in Phase II. Mr. Jim Stephens, Dr. Richard Nance, and Mrs. Elizabeth Twitchell made valuable contributions to the bibliography and glossary in Phase II.

In Phase III, the Dallas Pilot Model could never have operated had the following not participated:

Mr. David Reich, Dallas Public Library
Miss Marguerite Anderson, Richardson Public Library
Mr. Lowell Lindsay, Garland Public Library
Mrs. Viola Baird, Southwestern Medical School
Mrs. Robin Taylor, Southwest Center for Advanced Studies
Miss Jan Wolford, Mobil R & D Corporation
Mrs. Shula Schwartz, Texas Instruments Incorporated
Mrs. Virginia Brannen, Academy of Computer Technology
Mr. George Johnson, Bishop College
Mrs. Mayrelee Newman, El Centro Junior College
Mr. Jim Stephens, SMU Science/Engineering Library
Miss Lois Bailey, SMU Fondren Library
Mrs. Mickey Hill, Industrial Information Services
Miss Margaret Morris, University of Texas at Arlington
Miss Mattie Ruth Moore, Dallas Independent School District

The networking model in Phase IV is the result of Dr. Richard Nance's "labor of love" in this very complex area.

Lib-NAT (Phase V) would not have been possible without the participation of Mrs. Mickey Boyvey who contributed the visual graphics. Dr. Russell Shank, Mr. Richard Perrine, and Mr. and Mrs. Frederick G. Kilgour also contributed to Lib-NAT in various ways.

None of this project would have been possible without the financial and administrative support of Southern Methodist University, the encouragement and tolerance of the Industrial Information Services staff, and the efficiency of Mrs. Frances Fauteck, secretary-and-counselor, editor-first-class!!

APPENDIX

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APPENDIX A.1
ORIGINAL PROPOSAL

A PROPOSAL

FOR

A LIBRARY INTER-NETWORK STUDY, DEMONSTRATION AND PILOT MODEL

To Be Performed On Contract

for the

TEXAS STATE LIBRARY

Under
Title III, Library Services and Construction Act
Special Project Grant
By

Southern Methodist University

With the Cooperation of

Texas Library Association, Reference Round Table,

Goals for Dallas,

and Others

November 4, 1968

INTRODUCTION

The enclosed proposal is submitted to the Texas State Library in accord with the requirements outlined in "Application and General Information for a Special Project Grant, Library Services and Construction Act, Title III" transmitted to SMU on October 21, 1968, by the Texas State Library.

The project described herein has both local as well as statewide implication. It involves a close-up analysis of the inter-library and network interfacing in the Dallas area before, during, and after a Demonstration and Pilot Model of an experimental interfacing project. In addition, this proposal outlines a statewide project (in cooperation with the Texas Library Association Reference Round Table) to analyze existing networks and to develop an ideal statewide network interfacing all types of libraries and existing networks. In this latter mission, a Statewide Network Study Group (representing all the various existing library networks) will be appointed to advise and to participate in the planning of network development in Texas.

It would have been easy to submit a much simpler proposal for the same amount of funding. However, we at SMU sincerely believe that the opportunities for improved library and information services during the next decade cannot be fully realized until the fundamental parameters involved in "networking" are identified, analyzed, and evaluated cooperatively with all concerned parties in an open and straightforward manner. This we will attempt to do in the proposed Library Inter-Network Study, Demonstration and Pilot Model. This is a research project designed to develop (through analysis and experimentation) a quantitative methodology for interfacing of libraries in a network and for interfacing of different networks — for the purpose of improved library service to all citizens of Texas.

Maryann Duggan
November 4, 1968

APPLICATION

1. Name, mailing address and telephone number of initiating individual, group or agency:

   Maryann Duggan, Southern Methodist University, Science Library, Dallas, Texas 75222, A.C. 214, EM3-3011.

2. Describe the project ennumerating its aims and objectives.

The project is a Library Inter-Network Study, Demonstration and Pilot Model designed to:

1. Explore and develop ways and means for interfacing the existing library networks in Texas.
2. Identify and analyze the specific parameters that must be considered in interfacing these library networks.
3. Identify the kinds of existing networks in the state and analyze the operational features, service policies, financing and future plans of each.
4. Demonstrate experimentally the feasibility of interfacing the various types of libraries and networks through service agreements and telecommunication channels in a Dallas area Demonstration and Pilot Model.
5. Identify the costs involved in interfacing libraries and networks (message costs, transaction costs, indirect costs*) and determine fair and just allocation of costs among network participants.
6. Identify the direction of flow of requests, the types of requests, the success ratio in filling requests, and the problems of network interfacing in the Pilot Model.
7. Develop a basic ideal model for a library inter-network system in Texas showing levels of service, access points, switching points, network configuration, communication links, recommended fee structures and cost allocations, and administrative policy.
8. Present the findings of the Demonstration and Pilot Model and the statewide ideal model network to the TLA Reference Round Table Conference in a graphic, as well as descriptive, form enabling public critique.
9. Present to the Texas State Library and the Texas Library Association final summary report with specific recommendations.

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* Including methods of computing transaction costs as a function of basic capital cost of a library; i.e., amortization of the cost of the library.

3. Clearly demonstrate the relationship of the proposal to goals of the State Plan. Show how this project would further these goals.

This project will assist the statewide effort to maximize the use of the total library resources in the state by all types of library patrons, regardless of need, ability to pay, or geographical location. All types of libraries will be involved and, thus, the project will collect data and make recommendations on the interfacing procedures and policies necessary to achieve the goals of the State Plan. The recent findings of various national programs (such as the ALA Reference Service Division, the revised Inter-Library Loan Code, and the National Commission on Libraries) will be considered and incorporated in the planning. The data from this project should enable the progressive and orderly implementation of a statewide network interconnecting the various types of libraries allowing reciprocal and equitable use of the total state resources by all patrons.

4. Names, addresses and positions of personnel responsible for conducting this project. Describe the responsibilities of each.

This project will be under the direction of Maryann Duggan, Assistant Professor, Graduate Faculty, SMU. The work will be done cooperatively with the Reference Round Table of the Texas Library Association and a Statewide Network Study Group to be appointed by the Project Director. Personnel involved, position, and responsibility are as follows:

1. Project Direction and Main Responsibility:

   Maryann Duggan
   Science Library
   SMU
   Dallas, Texas 75222

   Miss Duggan will assign necessary staff to implement and complete the project as outlined under Section 5. She will be responsible for planning, scheduling, implementing, accounting, demonstration project, development of ideal model, summary presentation, and final report.

2. Reference Round Table, Texas Library Association

   a. Miss Maxine Johnson, Chairman
      Reference Round Table
      Lamar State College of Technology
      Beaumont, Texas

      Miss Johnson is responsible for scheduling the RRT Conference in Houston, March 26, 1969 (during which the project results will be reported) and for coordinating the project with the RRT and TLA.

   b. Mr. Dick Waters, RRT Coordinator
      Branch Coordinator
      Dallas Public Library
      Dallas, Texas 75201

      Mr. Waters is responsible for appointment of the 10 Major Resource Center Coordinators (listed below), for collecting and compiling the survey data on existing networks in Texas, and for presenting the summary results of the survey during the March 26 conference in Houston.

3. Statewide Network Study Group

   The Project Director will appoint the following individuals to serve on a Statewide Network Study Group for purpose of analysis and planning of network interfacing policies and procedures and for advising on the proposed ideal network. This group will consist of administrative heads of existing networks and of those agencies involved in networking or library development in the state. The persons to be appointed and their titles are as follows:

a. Miss Maxine Johnson, TLA Reference Round Table Chairman

b. Mr. Dick Waters, TLA Reference Round Table Coordinator

c. Each of the 10 Public Library Major Resource Center Coordinators:

   1) Mrs. Barbara Wade, Abilene Public Library, Abilene
   2) Miss Joe Battle, Helium Research Center, Amarillo
   3) Mrs. Helen Smith, Business Administration & Economics Library, Austin
   4) Mrs. Margaret Hancock, Texas College of Arts & Industries Library, Kingsville
   5) Robert Joyce Head, Casa View Branch, Dallas Public Library
   6) Mrs. Shelah Bell Cragin, El Paso Public Library
   7) Miss Janice Gohmert, Fort Worth Public Library
   8) Miss Ruby Weaver, Houston Public Library
   9) William D. Gooch, Ector County Public Library, Odessa
   10) Miss Catherine Montague, George Storch Memorial Library, San Antonio

d. Mr. Heartsill Young, Chairman, Library Development Committee, Texas Library Association

e. Mr. Dick Perrine, Chairman Reference Services Division, American Library Association

f. Miss Ammarette Roberts, President, Texas Chapter, Special Libraries Association

g. Mrs. Kay Franklin, President, Texas Association of School Librarians

h. Dr. Wilson Fahlberg, President, Texas Council of Health Science Libraries

i. Mrs. Wanda Sivells, President, Junior College Library Section, Texas Junior College Teachers Association

j. Mrs. Ann Graves, Reference Library, Texas State Library

k. Mrs. Mary R. Boyvey, Library Coordinator, Texas Educational Agency

l. Each Member of LSCA Title III Texas Advisory Council:

   1) Dr. Edward G. Holley (college & university libraries)
   2) Mrs. Flora Wilhite (Size II public libraries)
   3) Mrs. Lillian Bradshaw (major resource center libraries)
   4) Mr. James L. Love (Trustees)

5) Mrs. Mary Boyvey (school libraries)

6) Miss Maryann Duggan (special libraries)

m. Mrs. Dell DeHay, Southwestern Division of American Association of Law Libraries

n. Each of the Administrative Heads of the Existing Library on Information Networks, as follows:

1) Mrs. Marie Shultz, representing Texas State Library Communication Network

2) Mr. John Hudson, representing Texas Information Exchange and the Council of State College Libraries

3) Mr. Dick O'Keeffe, representing Regional Information and Communication Exchange

4) Col. Stanley Reiff, representing Inter-University Council

5) Dr. Robert Olson, representing The Association for Graduate Education and Research

6) Col. Wilbur Hurt, representing Texas Technology Application Network

7) Dr. Harry Ransom, representing Knowledge Network

8) Dr. John Bradford, representing Western Information Network

This Statewide Network Study Group will meet four times during the project and will be responsible for describing details of present networks (including policies, operating data, and procedures), identifying parameters of present network operations, and participating in the planning of future network developments in the state to reach the goals of the State Plan. Representatives from this Group will also participate in the March 26 conference in Houston.

4. Advisors and Consultants

In addition to the above, certain special advisors or consultants will be used as needed. Technical assistance in network modelling will be obtained from the Southwestern Bell Telephone Company and from Western Union.

5. Demonstration and Pilot Model Participants

For the local Demonstration and Pilot Model in the Dallas area, the following libraries will be invited to participate:

a. SMU Science Library* - Large private academic (departmental)

b. SMU Fondren Library - Large private academic

c. Southwestern Medical School - State supported medical library

* Including inter-library services to Southwest Center for Advanced Studies (SCAS)

d. University of Texas, Arlington - State university

e. Bishop College - Small, newly developed private academic

f. Dallas Public Library - Large public library (Main library and two branches)

g. Richardson Public Library - Small public library

h. Dallas Independent School District - Large school system (one grade school and one high school)

i. Richardson School District - Small School System

j. Mobil Research & Development Library - Large special library

k. Texas Instruments Library - Large, departmentalized special library

l. Dallas Chamber of Commerce Library - A public service agency

m. El Centro Junior College Library - A public junior college

n. Lone Star Gas Company Library - A special information center

o. Dallas County Library - A county library system

p. Veterans Administration Hospital Library - A government medical agency

A Local Advisory Council will be appointed to assist in the Demonstration and Pilot Model in the Dallas area. This Council will consist of a representative from the Dallas County Library Association, the Metropolitan Public Library Association, and the Goals for Dallas (Planning Committee and Library Task Force).

The participants in the Demonstration and Pilot Model will be responsible for collecting and reporting data on their inter-library transactions before, during, and after the Demonstration. This group will also assist in the designing of the Pilot Model for the Dallas area.

The data collected from the Demonstration and Pilot Model will be presented to the Statewide Network Study Group to assist them in planning an ideal state network.

5. Outline the general method to be followed in implementing the project and give the timetable for completion.

The Inter-Network Demonstration and Pilot Model project consists of two separate but inter-related projects, namely:

a. The statewide study and development of an ideal network jointly with TLA and the Statewide Network Study Group and

b. the Demonstration and Pilot Model in the Dallas area.

The general method to be followed in the statewide study is to collect data on existing networks, plan future network development in the Study Group, present our findings and recommendations to the Reference Round Table Conference in Houston on March 26, 1969, and publish the proceedings of the conference with recommended future action and implementation.

The general method to be followed in the Dallas Demonstration and Pilot Model is to solicit the cooperation of 16 participating libraries (representing six types), to collect data on inter-library services before the demonstration, to participate in the demonstration of total library cooperation, to identify systems problems and collect data on services requested during the demonstration, and to help formulate an ideal local inter-library network for the Dallas area, spelling out service levels, communication channels, fee structure, switching nodes, and procedures and costs for implementation.

The results of the Dallas area pilot model will be available to the Statewide Network Study Group for their use in planning the ideal state network. The timetable to be followed for the total project is as follows, assuming initiation on August 1, 1968:

TARGET DATE	EVENT
08-01-68	Preliminary planning, discussions and drafting of program.
09-01-68	Preliminary conferences and detail planning on project.
10-01-68	Planning conference in Austin with RRT.
11-07-68	Submit proposal to LSCA Title III Advisory Council.
11-12-68	Sign contract for project.
11-12-68	Appoint Statewide Network Study Group and determine participating libraries for Pilot Model.
11-13-68	Set up accounting procedures and forms; file voucher to 10-01-68.
11-15-68	Start summary of statewide survey results.
11-20-68	Start planning and collection of data on Pilot Model.
12-01-68	Install Telex and TWX in Dallas Demonstration and Pilot Model.

TARGET DATE	EVENT
12-05-68	Tabulate results of Statewide Survey and Pilot Model Inter-Library Use data.
12-13-68	First meeting of Statewide Network Study Group (in Houston at SLA) to identify parameters.
01-10-69	Start computer modelling of ideal statewide and local network.
01-20-69	File voucher for period 10-01-68 to 01-01-69.
02-01-69	Second meeting of Statewide Network Study Group to formulate ideal network (incorporating modelling and ALA data).
02-01-69	Designation of Participants in Reference Round Table Conference (03-26).
02-15-69	Mail invitations and programs and draft of Ideal Network to Reference Round Table members.
03-01-69	Collect data on 10 weeks' Demonstration and Pilot Model in Dallas.
03-10-69	Preparation of papers, slides, etc., for RRT Conference.
03-26-69	Reference Round Table Conference, Houston.
04-20-69	File voucher for period 01-01-69 to 04-01-69.
05-10-69	Third meeting of Statewide Network Study Group to plan implementation of Revised Ideal Network.
06-01-69	Collect data on six months' Demonstration and Pilot Model in Dallas.
06-15-69	Fourth Meeting of Statewide Network Study Group to review findings of Houston and Dallas Pilot Model and to make final recommendations on implementations.
06-20-69	Start publication of RRT conference proceedings, Pilot Model results and Statewide Network Study Group's recommendations.
06-29-69	File final voucher covering all expenses on project.

6. Set forth complete anticipated budget requirements to perform the project. Show full breakdown of the local matching and anticipated federal grant funds.

ANTICIPATED BUDGET REQUIREMENTS

BUDGET LINE ITEM	TOTAL COST	TITLE III FEDERAL FUNDS	LOCAL* FUNDS
1. Salaries	$ 6,800	$ 4,600	$ 2,200
2. Fringe Benefits	700	400	300
3. Consultants and Contractual Services	1,000	500	500
4. Committees, Workshops & Conferences	2,000	--	2,000
5. Travel	3,000	1,000	2,000
6. Communication Costs	3,000	3,000	--
7. Supplies & Printing	3,500	500	3,000
8. Rental or Purchasing of Equipment	1,000	1,000	--
9. Rental of Space	500	--	500
10. Minor Remodeling	100	--	100
11. Utilities	200	--	200
12. Janitors	200	--	200
	$ 22,000	$ 11,000	$ 11,000

* Local funds will be supplied by participants other than SMU except for line items 9-12. Donation of salaries and travel expense will be certified and will not exceed pro-rata daily salary, plus travel expenses of $16.00 per diem and .09/mile.

Budget Notes:

Line Item

1. Includes salary of principal investigators, necessary steno-clerical help and donated time from participants and study group.

3. Includes fee for consultants and donated time from technical specialists.

4. Includes cost of TLA RRT Conference and four meetings of Statewide Study Group.

5. Includes cost of travel by Statewide Study Group in connection with fulfilling the proposal, not to exceed $16.00 per diem and .09/mile for automobile or tourist fare on common carrier.

7. **The application should be signed by authorized official of the institution and the project director.**

Institutional representative*	**Project Director**
LeVan Griffis **Signature**	Maryann Duggan **Signature**
Dr. LeVan Griffis **Typewritten or printed signature above**	Maryann Duggan **Typewritten or printed signature above**
Vice-Provost **Title**	Assistant Professor **Title**
Southern Methodist University **Institution**	Southern Methodist University **Institution**
Perkins Administration Building **Mailing address**	Science Library **Mailing address**
Dallas, Texas 75222 **City State Zip**	Dallas, Texas 75222 **City State Zip**
214 EM3-5611 **Area Code Telephone number**	214 EM3-3011 **Area Code Telephone number**

*** Person authorized to contract for institution making application.**

APPENDIX A.2

LETTER OF CONTRACT

TEXAS STATE LIBRARY TEXAS ARCHIVES AND LIBRARY BUILDING
DRAWER DD/CAPITOL STATION/AUSTIN, TEXAS 78711

DORMAN H. WINFREY
DIRECTOR AND LIBRARIAN

MARIE SHULTZ
DIRECTOR, FIELD SERVICES DIVISION

TEXAS LIBRARY AND
HISTORICAL COMMISSION

November 20, 1968

Miss Maryann Duggan, Director
Industrial Information Services
Southern Methodist University
Dallas, Texas 75222

Dear Miss Duggan:

This is to acknowledge the agreement made verbally at the meeting of the Library Services and Construction Act, Title III Advisory Council on November 7, 1968 at Texas State Library.

The proposal which you presented at that time for Southern Methodist University with the cooperation of the Texas Library Association Reference Roundtable, Goals for Dallas group and others, (a copy of which is attached) has been accepted as a Special Project under Title III, Project 2 of the State Plan for Texas under the Library Services and Construction Act for FY 1969.

We understand that you will submit evidence of local expenditures for the project beginning September 1, 1968. The project will cover the period September 1, 1968 through June 30, 1969. Payments will be made on a quarterly basis upon receipt of acceptable evidence of local expenditures which can be used as matching funds to earn federal Title III, Library Services and Construction Act funds by the Texas State Library. The total of local eligible expenditures which will be matched by grant funds for this project will not exceed $11,000. Local expenditures will be subject to federal audit.

We understand that Texas State Library Field Services Division will receive a periodic report of progress being made during the operation period of the library inter-network study and demonstration pilot model. The final report generated from this demonstration and submitted to the State Library at the termination of the project will be evaluated by an out-of-state person chosen by the Title III Advisory Council. This report should be provided to the Texas State Library and access given to the records of the project. activities to the consultant employed to evaluate the project's effectiveness.

Texas State Library staff members look forward to working with you on this project.

Sincerely,

Marie Shultz
Mrs. Marie Shultz
Director
Field Services Division

Dorman H. Winfrey
Dorman H. Winfrey
Director and Librarian
Texas State Library
November 20, 1968

APPENDIX A.3

SUMMARY OF SMU'S LSCA TITLE III PROJECT FOR INCLUSION IN TEXAS STATE LIBRARY ANNUAL REPORT

August 10, 1969

1. Describe accomplishment(s) and failure(s):

Eighteen libraries (or library systems) of all types participated in analyzing interlibrary loans (or "document transfer") within and without the Pilot Model Area for the purpose of gaining insight into interlibrary networks. This project provided the vehicle for developing Lib-NAT, i.e. "library network analysis technique," which is composed of:

a. A Conceptual Model of an "Ideal Statewide Network", developed cooperatively with representatives from all types of libraries.

b. A Behavioral Model, developed cooperatively and experimentally tried at the Reference Round Table, in which 288 libraries participated.

c. A Symbolic Model, developed to graphically illustrate basic concepts of interlibrary networks including geographic/type relations and node/network dynamics.

d. An Analytical Model using operations research techniques illustrates critical network design parameters such as utility criteria (quality, cost and time).

Failures in the project relate to lack of sufficient time to perfect the Lib-NAT tools, collect more data on other libraries in the area, statistically correlate the data with possible operational variables, implement a "new" network interface for the Pilot Model Area, and develop contractual/funding arrangements for interfacing.

2. Describe problems encountered; special experiences and observations.

Inadequate time to achieve all goals was a major problem. Identifying matching funds and developing accounting system were difficult problems. Working closely with so many persons with diverse backgrounds and interests presented problems in meeting achievement time-table. Just "getting people together" for planning sessions was difficult operationally.

The attitudes of the many participating librarians toward cooperation and apparent willingness to experiment with new concepts were rewarding. The reception of Lib-NAT by the library community indicates a readiness to move forward into the networking phase of library development, with appropriate guidance and leadership.

3. Effectiveness of project in achieving objectives of state plan.

   This project indicates further steps necessary to reach the long-range goal of total participation of all types of library and information networks for reciprocal use of information resources by all patrons. This project developed a technique and methodology for analyzing document transfer networks and for designing networks to achieve maximum capability to serve all citizens of the state.

4. Materials for Publishing . . .

   The final report (due September 15, 1969) will contain copies of all the printed material developed during this project. Enclosed is a reprint from Texas Library Journal describing the project as presented to the TLA Reference Round Table. The Lib-NAT story will be published in the September issue of Journal of Library Automation. Oral presentations have been made to ALA (three divisions), Washington State Library, Rocky Mountain Bibliographical Center Board, and the Oklahoma State Library.

APPENDIX B

STATEWIDE STUDY GROUP AND CONCEPTUAL MODEL

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B.1	Invitation Letter for February 18, 1969 Meeting	B-2
B.2	List of Participants, February 18, 1969 Meeting	B-11
B.3	Handouts at February 18, 1969 Meeting	B-12
B.4	Minutes of February 18, 1969 Meeting	B-45

APPENDIX B.1

INVITATION LETTER FOR FEBRUARY 18, 1969 MEETING

January 27, 1969

File: Title III
Statewide Study

TO ALL PERSONS ON ATTACHED LIST

RE: STATEWIDE LIBRARY/INFORMATION NETWORK STUDY GROUP MEETING FEBRUARY 18

The Texas State Library has contracted with SMU to study ways and means to interface existing statewide library and information networks serving all types of users. The purpose of this study is to develop greater quantitative insight into present and future network operations so that an optimum statewide system of library and information service can be planned and proposed by July 1, 1969. This study is partially funded through Title III of Library Services and Construction Act.

The preliminary findings of this study will be presented in a Texas Library Association Reference Round Table Institute in Houston on March 26, 1969. The preliminary program of this Institute is enclosed for your information. The final results and recommendations of the study are due July 1, 1969.

In order for the statewide study to be meaningful, I feel that the Administrative heads of the existing library/information networks should be involved in the analysis and planning phase. We need quantitative date on the operational characteristics of each network.

We also need to know current policies and procedures of each network and any future plans or goals for future network developments in all types of libraries. We are sincerely seeking ideas on how the statewide library network system can be improved to provide optimum service to present and future users of all types.

We have scheduled a planning meeting of all network heads and typical network users on Tuesday, February 18, 8:30 a.m. to 4:00 p.m., SMU Science Information Center, Room 119. The purpose of this meeting is to identify the specific parameters of network performance and to develop the necessary procedures for modelling and simulating network design. Dr. Richard Nance, our consultant in network design, will be available to discuss details of network modelling. Mr. Richard Waters, chairman of TLA Statewide Network Survey Committee, will have available preliminary data from a recent survey of library/information network in Texas. A list of all persons invited to participate in the February 18 meeting is enclosed for your information. Also enclosed is a proposed agenda for the meeting and an outline of the kind of data needed for a valid network study.

We have no funds for payment of your expenses for participating in this study. In fact, we are asking that you donate your time and expenses to the matching funds requirements of the study. As a minimum, may we sincerely urge you to attend the February 18 planning meeting to explore ways and means of improved network development.

A reply form is enclosed for your convenience. If you have any questions, I would be pleased to talk with you. We look forward to your participation in this study and we sincerely need your presence at the February 18 meeting.

If you are not able to attend this meeting, could you please send a deputy to represent you so that we may have your thinking and participation.

Sincerely,

STATEWIDE NETWORK STUDY - TITLE III

Maryann Duggan rm

Maryann Duggan
Project Director

MD:rm

Encl.

cc: All persons on attached list

ENCLOSURE 1

STATEWIDE NETWORK STUDY GROUP

The following persons are invited to participate in the study and planning of improved statewide library/information networks on February 18, 1969, 8:30 a.m. to 4:00 p.m., SMU Science Information Center, Room 119:

1. Mrs. Mary Boyvey, Texas Educational Agency
2. Dr. John Bradford, representing Western Information Network
3. Mrs. Lillian Bradshaw, Major Resource Center Libraries, Title III Council
4. Mr. Truman Cook, Consultant on Network Design
5. Mrs. Dell DeHay, Southwestern Division of Southwestern Association of Law Libraries
6. Dr. Wilson Fahlberg, Texas Council of Health Science Libraries
7. Mrs. Kay Franklin, Texas Association School Librarians
8. Mrs. Ann Graves, Reference Library, Texas State Library
9. Dr. Edward Holley, LSCA, Title III and HEA Title IX Advisory Council
10. Mr. John Hudson, representing Texas Information Exchange and Council of State College Libraries
11. Col. Wilbur Hurt, representing Texas Technology Application Network
12. Miss Maxine Johnston, TLA Reference Round Table Chairman
13. Miss S. Janice Kee, Regional Library Program Consultant, O. E.
14. Mr. James L. Love, Trustee, Title III Council
15. Mr. Stanley McElderry, Consultant on Network Design
16. Mr. Edward Montgomery, Consultant on Network Design
17. Dr. Richard Nance, Consultant on Network Design
18. Mr. Richard O'Keeffe, representing Regional Information and Communication Exchange
19. Dr. Robert Olson, representing The Association for Graduate Education and Research

ENCLOSURE 1
Page 2

20. Mr. Ross Peavey, Consultant on Network Design

21. Mr. Richard Perrine, Reference Services Division, ALA

22. Dr. Harry Ransom, representing proposed Knowledge Network and President's Commission on Libraries

23. Col. Stanley Reiff, representing Inter-University Council

24. Miss Ammarette Roberts, Texas Chapter, SLA

25. Mr. Prentiss Selby, Consultant on Network Design

26. Mrs. Marie Shultz, representing Texas State Library Communications Network

27. Mrs. Wanda Sivells, Junior College Library Section, Texas Junior College Teachers Association

28. Mr. James Stephens, Consultant on Network Design

29. Mr. Richard Waters, TLA Statewide Network Survey Committee

30. Mrs. Flora Wilhite, Size II Public Libraries, Title III Council

31. Mr. Heartsill Young, Library Development Committee, TLA

B-6

Preliminary Program

COOPERATIVE INFORMATION AND REFERENCE SERVICES - LIBRARY NETWORKS

TLA Reference Round Table Pre-conference Institute

Albert Thomas Convention Center   Downtown Houston, Texas
March 26, 1969

8:30 a.m. - Registration

9:00 a.m. - Opening Remarks and Objectives of Institute
Maxine Johnston, Chairman, Reference Round Table

9:10 a.m. - Recent Developments on the National Scene
Richard Perrine, President, ALA Reference Services Division
Ed Holley, Librarian on Office of Education's Knowledge Networks Task Force

9:30 a.m. - Texas Library Networks and Cooperative Reference Services Survey
Richard Waters, Chairman, RRT Institute Planning Committee

10:15 a.m. - Questions and Discussion from Attendees

10:30 a.m. - Coffee

10:45 a.m. - Reference Librarians and Networks -- What It's All About: Houston and Dallas Case Studies
Richard O'Keefe, Project Director, LSCA Title III - Houston
Maryann Duggan, Project Director, LSCA Title III - Dallas

11:30 a.m. - Questions and Discussion from Attendees

12:00 noon - Lunch (Included in Registration Fee)

1:00 p.m. - "Games Librarians Play" or A Day in the Life of an Inter-Library Loan Librarian
Francine Morris, University of Texas at Arlington, Texas Library

1:15 p.m. - Model Library Network and Library Network Modeling
Dr. Richard Nance, S.M.U. Institute of Technology

2:00 p.m. - Questions and Discussion from Attendees

2:15 p.m.	-	The Ideal Library Network for Texas
2:45 p.m.	-	Coffee
3:00 p.m.	-	Networking Your Own Library - Discussion and Critique from Attendees
3:45 p.m.	-	The Future - Where Do We Go From Here Report of Official Listeners & Discussion from Attendees
4:20 p.m.	-	Summary
4:30 p.m.	-	Reference Round Table Plans for the Future
4:45 p.m.	-	Adjournment

OBJECTIVES OF THE INSTITUTE

1. To summarize development (national, state, and local) in cooperative reference and information services since the 1968 TLA Reference Round Table Institute.
2. To explore new thinking and approaches to the examination and use of cooperative reference services and library networks.
3. To apply network concepts to local library situations.
4. To develop an ideal state-wide, inter-library reference network through participation of institute attendees.
5. To identify future developments needed in cooperative reference and inter-library networks in Texas.

Participants will include public librarians, college and university librarians, information scientists, school librarians; a few administrators; and a sprinkling of mathematicians, theorists, and Devil's Advocates.

Audience participation (all attendees will be in a simulated network during the Institute) and brainstorming is welcome and encouraged. Together, reference and information librarians will develop insight and know-how in building cooperative reference services through and with library networks.

ENCLOSURE 3

PROPOSED AGENDA

STATEWIDE NETWORK STUDY GROUP

FEBRUARY 18, 1969
SMU SCIENCE INFORMATION CENTER
DALLAS, TEXAS

8:30 a.m.	Opening Remarks and Purpose of Meeting
9:00 a.m.	Summary Report on Statewide Network Survey - Dick Waters
10:00 a.m.	Coffee
10:15 a.m.	Summary Report on Network Modelling - Dick Nance
11:00 a.m.	Network Performance Characteristics (Data Gathering)
12:00 noon	Lunch
1:00 p.m.	Summary Report on Reference Round Table Conference Objectives
1:30 p.m.	Ideal Model Statewide Network - Conceptual Design
2:30 p.m.	Coffee
2:45 p.m.	Reports from Each Existing Network - Status and Future Plans
3:45 p.m.	Strategy and Goals for Future Statewide Network Development

* * *

ENCLOSURE 4

TYPES OF DATA NEEDED TO EVALUATE NETWORK PERFORMANCE

The following network characteristics will be discussed during the February 18 meeting. Please bring available data on your network.

I. Users and Operators

  a. Primary User Group
  b. Secondary User Group
  c. Operator Group

II. Administrative Aspects

  a. Legal Authorization
  b. Organization Structure
  c. Contractual Agreements (Operators and Users)

III. Financial Aspects

  a. Operational Budget
  b. Fee Structure
  c. Source of Funds
  d. Cost Data per Service Unit

IV. Resources

  a. Data Base
  b. In-House Resources
  c. Access to Other Resources

V. Services

  a. Document Transfer
  b. Search Service
  c. Referral
  d. Switching
  e. Other

VI. Network Configuration

  a. Location of Nodes
  b. Location of Switching Center
  c. Patterns of Use

VII. Interfacing with Other Networks

  a. Currently Active
  b. Planned
  c. How

VIII. Telecommunications

  a. Terminal Services - Type & Capacity
  b. Channels - Location & Width
  c. Other Hardware Capability

IX. Volume of Activity

  a. Messages or Requests - Number
  b. Messages or Requests - Length
  c. Document Flow
  d. Other Uses

X. Time vs. Cost vs. Quality

XI. Problems

XII. Switching Levels

  a. Homogeneous
  b. Heterogeneous
  c. Vertical
  d. Horizontal
  e. Local
  f. State
  g. National

ENCLOSURE 5

RESERVATION FOR FEBRUARY 18 MEETING

Send to:

Maryann Duggan, Director
Industrial Information Services
Southern Methodist University
Dallas, Texas 75222

I (____ will) (____ will not) attend the February 18 Statewide Network Study Group Meeting at SMU.

I (____ will) (____ will not) send a deputy to represent my thinking and area of interest in statewide network development. The Deputy is: ______________________________.

I (____ am) (____ am not) interested in actively participating in such a Study Group during the next 6 months (requiring attendance at two additional statewide meetings) and am willing to donate my time and expenses.

____
Signed

____
Address

____
Telephone No.

APPENDIX B.2

STATEWIDE STUDY GROUP ON LIBRARY NETWORKS

FIRST MEETING - FEBRUARY 18, 1969

PARTICIPANTS

1. Mrs. Mary Boyvey, Texas Educational Agency
2. Mrs. Virginia Brannen, University Computing Company
3. Mr. John Carpenter, Southwest Center for Advanced Studies
4. Mr. Truman Cook, Consultant on Network Design, SMU
5. Dr. William Fahlberg, Texas Council on Health Science Libraries
6. Mrs. Catherine Franklin, Texas Association School Librarians
7. Mrs. Ann Graves, Reference Library, Texas State Library
8. Dr. LeVan Griffis, Vice Provost, SMU

*9. Mr. John Hudson, representing Texas Information Exchange and Council of State College Libraries

10. Miss Maxine Johnston, TLA Reference Round Table Chairman
11. Miss S. Janice Kee, Regional Library Program Consultant, Office of Education

*12. Mr. Stanley McElderry, Consultant on Network Design

13. Mr. Edward Montgomery, Consultant on Network Design
14. Dr. Richard Nance, Consultant on Network Design, SMU
15. Mr. Carl Peters, Southwest Center for Advanced Research
16. Mr. Ross Peavey, Southwest Center for Advanced Research
17. Mr. Richard Perrine, Reference Services Division, ALA
18. Col. Stanley Reiff, representing Inter-University Council
19. Miss Ammarette Roberts, Texas Chapter, SLA

*20. Mr. Robert F. Schenkkan, T E M P, University of Texas

21. Mr. Frank Seay, Administrative Assistant to the President, SMU

*22. Mr. Prentiss Selby, Consultant on Network Design

23. Mrs. Marie Shultz, representing Texas State Library Communications Network
24. Mrs. Dorothy Sinclair, University of Houston, SETINA
25. Mrs. Wanda Sivells, Junior College Library Section, Texas Junior College Teachers Association
26. Mr. James Stephens, Consultant on Network Design, SMU
27. Mr. Forest Ward, Programs Division, Coordinating Board
28. Mr. Richard Waters, TLA Statewide Network Survey Committee
29. Dr. Robert Whipple, Texas Technological College, WIN
30. Mrs. Flora Wilhite, Size II Public Libraries, Title III Council
31. Mr. Dick Yoes, T E M P, University of Texas

*32. Mr. Heartsill Young, Library Development Committee, TLA

* * *

*Were unable to attend meeting, but participated via telephone and correspondence.

APPENDIX B.3

HANDOUTS AT FEBRUARY 18, 1969 MEETING

Page

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c. Operational Characteristics of Texas Networks B-15
d. Matching Funds Identification B-18
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g. Map Showing Texas Planning Regions B-27
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j. Western Information Network Association Law B-30
k. Western Information Network Folder B-40
l. The Knowledge Network Report B-44
(Title page only duplicated; entire report handed out at meeting)

STATEWIDE STUDY GROUP ON LIBRARY NETWORKS

FIRST MEETING - FEBRUARY 18, 1969

AGENDA

8:30 a.m.	Opening Remarks and Purpose of Meeting
9:00 a.m.	Summary Report on Statewide Network Survey - Dick Waters
10:00 a.m.	Coffee
10:15 a.m.	Summary Report on Network Modeling - Dick Nance
11:00 a.m.	Network Performance Characteristics (Data Gathering)
12:00 noon	Lunch
1:00 p.m.	Summary Report on Reference Round Table Conference Objectives
1:30 p.m.	Ideal Model Statewide Network - Conceptual Design
2:30 p.m.	Coffee
2:45 p.m.	Reports from Each Existing Network - Status and Future Plans
3:45 p.m.	Strategy and Goals for Future Statewide Network Development

* * *

STATEWIDE STUDY GROUP ON LIBRARY NETWORKS

FIRST MEETING - FEBRUARY 18, 1969

OBJECTIVES

1. To determine the Operational Parameters of existing or proposed
   a. Communication Networks
   b. Library/Information Networks

2. To develop a Conceptual Design of an Ideal Inter-Library Network for Texas.

3. To explore the possible interfacing of Communication Networks and Inter-Library Networks.

* * *

OPERATIONAL CHARACTERISTICS OF TEXAS NETWORKS

Data Supplied By ______________________ Name of Network ______________________

Date ______________________ Address of Headquarters ______________________

CHARACTERISTICS I. USERS & OPERATORS a. Primary User Group	
b. Secondary User Group	
c. Operator Group	
II. ADMINISTRATIVE ASPECTS a. Legal Authorization	
b. Organization Structure	
c. Contractual Agreements	
III. FINANCIAL ASPECTS a. Operational Budget	
b. Fee Structure	
c. Source of Funds	
d. Cost/Service Unit	
IV. RESOURCES a. Data Base	
b. In-House Resources	
c. Access to Other Resources	

OPERATIONAL CHARACTERISTICS OF TEXAS NETWORKS Name of Network

CHARACTERISTICS	
V. SERVICES	
a. Document Transfer	
b. Search Service	
c. Referral	
d. Switching	
e. Other	
VI. NETWORK CONFIGURATION	
a. Location of Nodes	
b. Location of Switching Center	
c. Patterns of Use	
d. Message Volume on Each Link	
VII. INTERFACING	
a. Active Interfaces	
b. Planned Interfaces	
c. How Done. Contract?	
VIII. TELECOMMUNICATIONS	
a. Terminals - Type	
b. Terminals - Capacity	
c. Channels - Location	
d. Channels - Width	

OPERATIONAL CHARACTERISTICS OF TEXAS NETWORKS Name of Network

CHARACTERISTICS VIII. TELECOMMUNICATIONS (cont.) e. Other Special Hardware Computers, FAX, etc.	
IX. VOLUME OF ACTIVITY a. Messages - No./month	
b. Requests - No./month	
c. Length of Messages (Avg.)	
d. Document Flow	
e. Other Uses	
f. Hours/week Operations	
X. UTILITY	
XI. PROBLEMS	

L S C A TITLE III

STATEWIDE STUDY GROUP ON LIBRARY NETWORKS

MATCHING FUNDS IDENTIFICATION

TO WHOM IT MAY CONCERN:

The following individuals attended a Meeting of the Statewide Study Group on Library Networks on ____________________________, from __________ to __________, at ____. These individuals authorize their time and travel expense for this meeting to be used as matching funds for the SMU LSCA TITLE III Project.

Certified and
Witnessed by: __________________________

Title __________________________

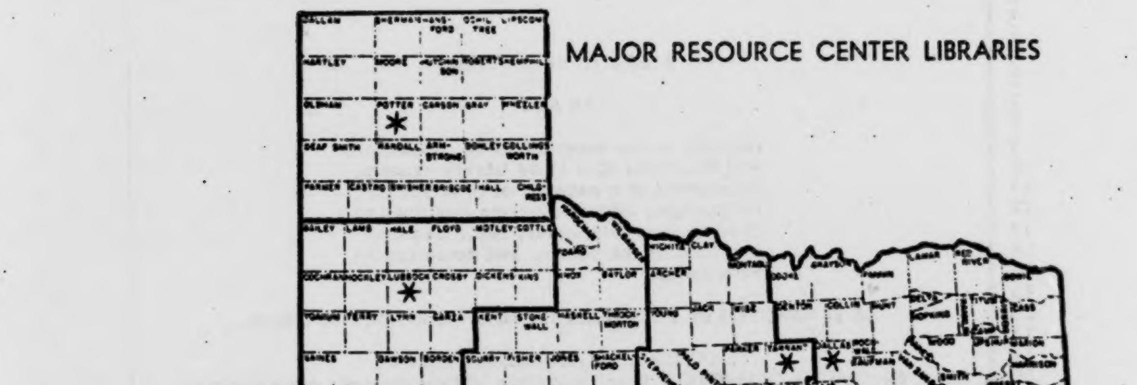
NAME (PLEASE SIGN)	INSTITUTION & LOCATION	TRAVEL EXP*	T I M E**		TOTAL
			HRS.	$ VALUE	

* Not to exceed 9¢ per mile (or actual plane fare) or $14.00 per diem.

** Include time preparing for meetings as well as time at meetings.

Texas State Library
Field Services Division
Drawer DD - Capitol Station
Austin, Texas 78711

B-19



Tentative boundaries for library districts determined by the Library Development Committee of the Texas Library Association, August, 1966.

Public libraries designated as Major Resource Centers:

Abilene
Amarillo
Austin
Corpus Christi
Dallas
El Paso
Fort Worth
Houston
Lubbock
San Antonio

B-20

By ______________________ _.B. No. __________

A BILL TO BE ENTITLED

AN ACT

relating to the establishment, operation, and financing of a state library system consisting of a network of interrelated cooperating library systems designed to provide adequate library facilities and services to the public; and declaring an emergency.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF TEXAS:

CHAPTER A. GENERAL PROVISIONS

Section 1. PURPOSE. Since adequate library services are essential to the cultural, educational, and economic development of the state and to the health, safety, and welfare of its people, and are the responsibility of government at all levels, and since the state has a financial responsibility for promoting public education and the public library is a vital agency serving all levels of the educational process, it is the policy of this state to promote, support, and implement through state grants-in-aid and other means the development and maintenance of a network of library systems to provide adequate public facilities and services to every citizen.

Sec. 2. SHORT TITLE. This Act may be cited as the Library Systems Act.

Sec. 3. DEFINITIONS. In this Act, unless the context requires a different definition.

(1) "public library" means a library operated by a single public agency that is freely open to all persons under identical conditions and receives its financial support in whole or in part from public funds;

(2) "Commission" means the Texas State Library and Historical Commission;

(3) "State Librarian" means the director and librarian of the Texas State Library;

(4) "library system" means two or more public libraries cooperating in a system approved by the Commission to improve library service and to make their resources accessible to all residents of the area which the member libraries collectively serve;

(5) "state library system" means a network of library systems, interrelated by contract, for the purpose of organizing library resources and services for research, information, and recreation to improve statewide library service and to serve collectively the entire population of the state;

(6) "major resource system" means a network of library systems attached to a major resource center, consisting of area libraries joined cooperatively to the major resource center and of community libraries joined cooperatively to area libraries or directly to the major resource center;

(7) "major resource center" means a large public library serving a population of 200,000 or more within 4,000 or more square miles, and designated as the central library of a major resource system for referral service from area libraries

in the system, for cooperative service with other libraries in the system, and for federated operations with other libraries in the system;

(8) "area library" means a medium-sized public library serving a population of 25,000 or more, which has been designated as an area library by the Commission and is a member of a library system interrelated to a major resource center;

(9) "community library" means a small public library serving a population of less than 25,000, which is a member of a library system interrelated to a major resource center;

(10) "contract" means a written agreement between two or more libraries to cooperate, consolidate, or receive one or more services;

(11) "standards" means the criteria established by the Commission which must be met before a library may be accredited and eligible for membership in a major resource system;

(12) "accreditation of libraries" means the evaluation and rating of public libraries and library systems using the standards as a basis;

(13) "governing body" means that body which has the power to authorize a library to join, participate in, or withdraw from a library system; and

(14) "library board" means the body which has the authority to give administrative direction or advisory counsel to a library or library system.

CHAPTER B. STATE LIBRARY SYSTEM

Sec. 4. ESTABLISHMENT. The Commission shall establish and develop a state library system.

Sec. 5. ADVISORY BOARD. (a) The Commission shall appoint an advisory board of five librarians qualified by training, experience, and interest to advise the Commission on the policy to be followed in the application of the provisions of this Act.

(b) The term of office of a board member is three years, except that the initial members shall draw lots for terms, one to serve a one-year term, two to serve a two-year term, and two to serve a three-year term.

(c) The board shall meet at least once a year. Other meetings may be called by the Commission during the year.

(d) The members of the board shall serve without compensation, but shall be reimbursed their actual and necessary expenses incurred in the performance of their official duties.

(e) Vacancies shall be filled for the remainder of the unexpired term in the same manner as original appointments.

(f) No member may serve more than two consecutive terms.

Sec. 6. PLAN OF SERVICE. The State Librarian shall submit an initial plan for the establishment of the state library system and an annual plan for the development of the system for review by the advisory board and approval by the Commission.

CHAPTER C. MAJOR RESOURCE SYSTEM

Sec. 7. AUTHORITY TO ESTABLISH. The Commission may establish and develop major resource systems in conformity with the plan for a state library system as provided in Chapter B, Sec. 6 of this Act.

Sec. 8. MEMBERSHIP IN SYSTEM. (a) Eligibility for membership in the system is dependent on accreditation of the library by the Commission on the basis of standards established by the Commission.

(b) To meet population change, economic change, and changing service strengths of member libraries, a major resource system may be reorganized, merged with another system, or partially transferred to another system by the Commission with the approval of the appropriate governing bodies of the libraries comprising the system.

Sec. 9. OPERATION AND MANAGEMENT. (a) Governing bodies within a major resource system area may join in the development, operation, and maintenance of the system and appropriate and allocate funds for its support.

(b) Governing bodies of political subdivisions of the state may negotiate separately or collectively a contract with the governing bodies of member libraries of a major resource system for all library services or for those services defined in the contract.

(c) On petition of 10 percent of the qualified electors in the latest general election of a county, city, town, or village within the major resource system service area, the governing body of that political subdivision shall call an election to vote on the question of whether or not the political subdivision shall establish contractual relationships with the major resource system.

(d) The governing body of a major resource center and the Commission may enter into contracts and agreements with the governing bodies of other libraries, including but not limited to other public libraries, school libraries and media centers, academic libraries, technical information and research libraries, or systems of such libraries to provide specialized resources and services to the major resource system in effecting the purposes of this Act.

Sec. 10. WITHDRAWAL FROM MAJOR RESOURCE SYSTEM. (a) The governing body of any political subdivision of the state may by resolution or ordinance withdraw from the system. Notice of withdrawal must be made not less than 90 days before the end of the major resource center fiscal year.

(b) The provision for termination of all or part of a major resource system does not prohibit revision of the system by the Commission, with approval of the appropriate governing bodies, by reorganization, by transfer of part of the system, or by merger with other systems.

(c) The governing body of a public library which proposes to become a major resource center shall submit an initial plan of service for the major resource system to the State Librarian. Thereafter, the governing body of the major resource center shall submit an annual plan of system development, made in consultation with the advisory council, to the State Librarian.

Sec. 11. ADVISORY COUNCIL. (a) An advisory council for each major resource system is established, consisting of six lay members representing the member libraries of the system.

(b) The governing body of each member library of the system shall elect or appoint a representative for the purpose of electing council members. The representatives shall meet within 10 days following their selection and shall elect the initial council from their group. Thereafter, the representatives in an annual meeting shall elect members of their group to fill council vacancies arising due to expiration of terms of office. Other vacancies shall be filled for the unexpired term by the remaining members of the council. The major resource center shall always have one member on the council.

(c) The term of office of a council member is three years, except that the initial members shall draw lots for terms, two to serve a one-year term, two to serve a two-year term, and two to serve a three-year term. No individual may serve more than two consecutive terms.

(d) The council shall elect a chairman, vice chairman, and secretary.

(e) The council shall meet at least once a year. Other meetings may be held as often as is required to transact necessary business. A majority of the council membership constitutes a quorum. The council shall report business transacted at each meeting to all member libraries of the system.

(f) The council shall serve as a liaison agency between the member libraries and their governing bodies and library boards to:

(1) advise in the formulation of the annual plan for service to be offered by the system;

(2) recommend policies appropriate to services needed;

(3) evaluate services received;

(4) counsel with administrative personnel; and

(5) recommend functions and limitations of contracts between cooperating agencies.

(g) The functions of the advisory council in no way diminish the powers of local library boards.

CHAPTER D. CONSTITUENTS OF MAJOR RESOURCE SYSTEMS

Sec. 12. MAJOR RESOURCE CENTER. (a) The Commission may designate major resource centers. Designation shall be made from existing public libraries on the basis of criteria approved by the Commission and agreed to by the governing body of the library involved.

(b) The governing body of the library designated by the Commission as a major resource center may accept the designation by resolution or ordinance stating the type of service to be given and the area to be served.

(c) The Commission may revoke the designation of a major resource center which ceases to meet the criteria for a major resource center or which fails to comply with obligations stated in the resolution or ordinance agreements. The Commission shall provide a fair hearing on request of the major resource center.

(d) Funds allocated by governing bodies contracting with the major resource center and funds contributed from state grants-in-aid for the purposes of this Act shall be deposited with the governing body operating the major resource center following such procedures as may be agreed to by the contributing agency.

(e) The powers of the governing board of the major resource center in no way diminish the powers of local library boards.

Sec. 13. AREA LIBRARY. (a) The Commission may designate area libraries within each major resource system service area to serve the surrounding area with library services for which contracts are made with participating libraries. Area libraries may be designated only from existing public libraries and on the basis of criteria approved by the Commission and agreed to by the governing body of the library involved.

(b) The governing body of the library designated by the Commission as an area library may accept the designation by resolution or ordinance stating the type of service to be given and the area to be served.

(c) The Commission may revoke the designation of an area library which ceases to meet the criteria for an area library or fails to comply with obligations stated in the resolution or ordinance agreement. The Commission shall provide a fair hearing on request of the major resource center or area library.

(d) Funds allocated by governing bodies contracting with the area library and funds contributed from state grants-in-aid for the purposes of this Act shall be deposited with the governing body operating the area library following such procedures as may be agreed to by the contributing agency.

Sec. 14. COMMUNITY LIBRARY. (a) Community libraries accredited by the Commission are eligible for membership in a major resource system.

(b) A community library may join a system by resolution or ordinance of its governing body and execution of contracts for service.

(c) The Commission may terminate the membership of a community library in a system if the community library loses its accreditation by ceasing to meet the minimum standards established by the Commission or fails to comply with obligations stated in the resolution or ordinance agreement.

CHAPTER E. STATE GRANTS-IN-AID TO LIBRARIES

Sec. 15. ESTABLISHMENT. (a) A program of state grants within the limitations of funds appropriated by the Texas Legislature shall be established.

(b) The program of state grants shall include one or more of the following:

(1) system operation grants, to strengthen major resource system services to member libraries, including grants to reimburse other libraries for providing specialized services to major resource systems;

(2) incentive grants, to encourage libraries to join together into larger units of service in order to meet criteria for major resource system membership;

(3) establishment grants, to help establish libraries which will qualify for major resource system membership in communities without library service; and

(4) equalization grants, to help libraries in communities with relatively limited taxable resources to meet criteria for major resource system membership.

Sec. 16. RULES AND REGULATIONS. (a) Proposed initial rules and regulations necessary to the administration of the program of state grants, including qualifications for major resource system membership, shall be formulated by the State Librarian with the advice of the advisory board.

(b) These proposed rules and regulations shall be published in the official publication of the Texas State Library. Such publication shall include notice of a public hearing before the Commission on the proposed rules and regulations to be held on a date certain not less than 30 nor more than 60 days following the date of such publication.

(c) Following the public hearing, the Commission shall approve the proposed rules and regulations or return them to the State Librarian with recommendations for change. If the Commission returns the proposed rules and regulations to the State Librarian with recommendations for change, the State Librarian shall consider the recommendations for change in consultation with the advisory board and resubmit the proposed rules and regulations to the Commission for its approval.

(d) Revised rules and regulations shall be adopted under the same procedure provided in this Chapter for the adoption of the initial rules and regulations.

Sec. 17. ADMINISTRATION. The State Librarian shall administer the program of state grants and shall promulgate the rules and regulations approved by the Commission.

Sec. 18. FUNDING. (a) The Commission may use funds appropriated by the Texas Legislature for personnel and other administrative expenses necessary to carry out the provisions of this Act.

(b) Libraries and library systems may use state grants for materials; for personnel, equipment, and administrative expenses; and for financing programs which enrich the services and materials offered a community by its public library.

(c) State grants may not be used for site acquisition, construction, or for acquisition, maintenance, or rental of buildings, or for payment of past debts.

(d) State aid to any free tax-supported public library is a supplement to and not a replacement of local support.

CHAPTER F. OTHER PROVISIONS

Sec. 19. SEVERABILITY. If any provision of this Act or the application thereof to any person or circumstances is held invalid, such invalidity shall not affect other provisions or applications of the Act which can be given effect without the invalid provision or application, and to this end the provisions of this Act are declared to be severable.

Sec. 20. EMERGENCY CLAUSE. The importance of this legislation and the crowded condition of the calendars in both houses create an emergency and an imperative public necessity that the Constitutional Rule requiring bills to be read on three several days in each house be suspended, and this Rule is hereby suspended.

Prepared by
TEXAS LIBRARY ASSOCIATION

For further information on the Proposed Library Systems Act,
contact the Director of one of the following libraries:

Abilene Public Library
202 Cedar Street
Abilene 79601

Mary E. Bivins Memorial Library
Post Office Box 2171
Amarillo 79105

Austin Public Library
Post Office Box 2287
Austin 78767

La Retama Public Library
505 North Mesquite
Corpus Christi 78401

Dallas Public Library
1954 Commerce
Dallas 75201

El Paso Public Library
501 North Oregon Street
El Paso 79901

Fort Worth Public Library
9th and Throckmorton
Fort Worth 76102

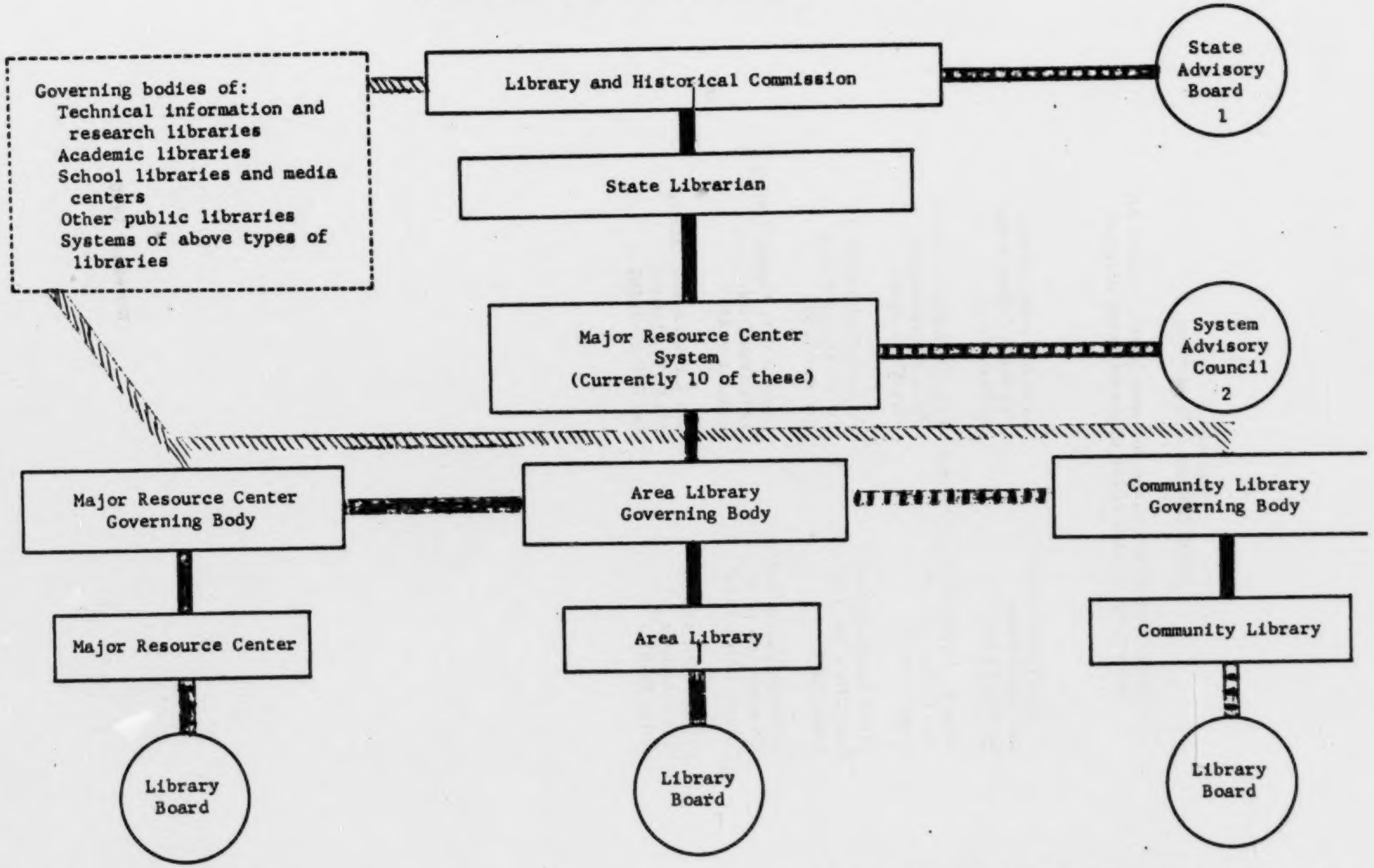
Houston Public Library
500 McKinney Avenue
Houston 77002

Lubbock City-County Library
2001 19th Street
Lubbock 79401

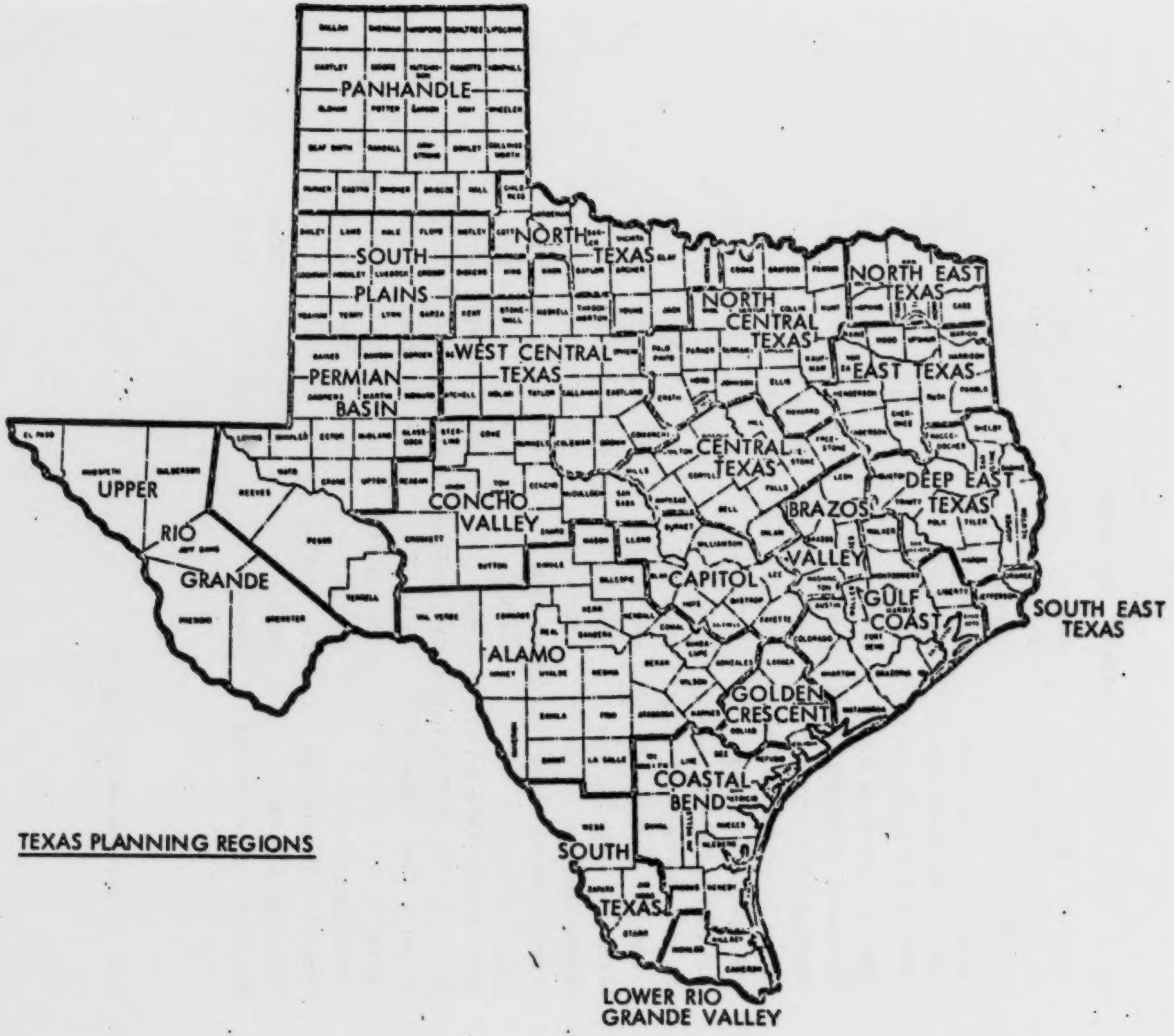
San Antonio Public Library
203 S. St. Mary's
San Antonio 78205

November 1968

PROPOSED TEXAS LIBRARY SYSTEM


Governing bodies of:
Technical information and research libraries
Academic libraries
School libraries and media centers
Other public libraries
Systems of above types of libraries
Library and Historical Commission
State Advisory Board 1
State Librarian
Major Resource Center System (Currently 10 of these)
System Advisory Council 2
Major Resource Center Governing Body
Area Library Governing Body
Community Library Governing Body
Major Resource Center
Area Library
Community Library
Library Board
Library Board
Library Board
▬ Administrative
▨ Contractual
▦ Advisory

1. Five librarians appointed by the State Library and Historical Commission.
2. Six lay representatives from governing bodies included in the System.


PANHANDLE
SOUTH PLAINS
NORTH TEXAS
NORTH EAST TEXAS
NORTH CENTRAL TEXAS
WEST CENTRAL TEXAS
PERMIAN BASIN
EAST TEXAS
UPPER RIO GRANDE
CONCHO VALLEY
CENTRAL TEXAS
DEEP EAST TEXAS
BRAZOS VALLEY
CAPITOL
GULF COAST
SOUTH EAST TEXAS
ALAMO
GOLDEN CRESCENT
COASTAL BEND
SOUTH TEXAS
LOWER RIO GRANDE VALLEY

TEXAS PLANNING REGIONS

T.I.E.
STATE UNIVERSITY AND COLLEGE
LIBRARY TWX SYSTEM

Univ. of Texas	Austin	910 874 1304	TXU
U. of T. at Arlington	Arlington	910 890 5135	TXARLA
*U. of T. Med. School	Galveston	910 885 5225	TXGUM
Midwestern University	Wichita Falls	910 890 5823	TXWIM
East Texas State Univ.	Commerce	910 860 5112	TXCOMT
North Texas State Univ.	Denton	910 810 5795	TXDN
Prairie View A. & M.	Prairie View	910 880 4620	TXPRC
*Southwest Texas State Col.	San Marcos	910 870 1981	TXSM
Texas A. & I. Univ.	Kingsville	910 870 1910	TXKT
Lamar State Col. of Tech.	Beaumont	910 884 5137	TXBL
*Pan American College	Edinburg	910 870 1561	TXEPA
Sam Houston State College	Huntsville	910 880 4611	TXHUT
M. D. Anderson Hosp. Lib.	Houston	910 881 3756	TXHMD
Stephen F. Austin St. Col.	Nacogdoches	910 880 4225	TXNACS
*Tarleton State College	Stephenville	910 890 4850	TXSVT
Texas Southern Univ.	Houston	910 881 3745	TXHT
Texas Technological College	Lubbock	910 896 4313	TXLT
Univ. of Houston	Houston	910 881 3754	TXHU
West Texas State Univ.	Canyon	910 899 4291	TXCAW
U.T., S. Tex. Med. School	San Antonio	910 871 1050	TXSAS
U. of T. Med. School	Dallas	910 861 4946	TXDAS
Texas A. & M. Univ.	College Sta.	910 880 4425	TXCM
Texas Women's Univ.	Denton	910 890 5796	TXDTW
*Angelo State College	San Angelo	910 897 5534	TXSANA
Sul Ross College	Alpine	910 897 5450	TXALS
*U. of T. Dental School	Houston	910 881 3765	TXUD

*Not in service as of 9/22/68.

TIE PHOTOCOPY SUMMARY, CUMULATED THROUGH MARCH 31, 1968

	SENT	RECEIVED	DUE TIE	TO BE PAID
Angelo State College	0	272	$ 27.20	$
East Texas State University	58	425	36.70	
Lamar State College of Technology	12	84	7.20	
M. D. Anderson Hospital Library	0	386	88.60	
Midwestern University	24	1043	101.90	
North Texas State University	1549	476		107.30
Pan American College	0	317	31.70	
Prairie View A and M	0	159	15.90	
Sam Houston State College	77	1033	95.60	
Southwest Texas State College	169	553	38.40	
Stephen F. Austin State College	485	604	11.90	
Sul Ross College	0	283	28.30	
Tarleton State College	0	137	13.70	
Texas A and I University	36	121	8.50	
Texas A and M University	1680	1402		27.80
Texas Southern University	58	192	13.40	
Texas Technological College	1640	3283	164.30	
Texas Woman's University	448	17		43.10
University of Houston	2170	2181	1.10	
University of Texas	6288	921		536.70
University of Texas at Arlington	148	227	7.90	
University of Texas Dental School	0	395	39.50	
Southwestern Medical School at Dallas	596	104		49.20
University of Texas Medical School at Galvelston	816	629		18.70
University of Texas South Texas Medical School	17	175	15.80	
West Texas State University	296	466	17.00	
University of Texas at El Paso	0	173	17.30	
			$935.30	$782.80

60th Legislature - Regular Session

WESTERN INFORMATION NETWORK ASSOCIATION

H.B. No. 692

AN ACT

relating to the creation and operation of the Western Information Network Association and the creation and operation of additional regional information network associations by the Coordinating Board, Texas College and University System, all of which associations are state agencies comprised of certain institutions of higher education in the State of Texas whose function is the acquisition and operation of a cooperative system for communication, information retrieval and transfer, and instructional television interchange between the institutions and by contract between the institutions and private educational institutions, school districts, industry, and the general public; providing for severability; and declaring an emergency.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF TEXAS:

SUBCHAPTER A. GENERAL PROVISIONS

Section 1. PURPOSE. The purpose of this Act is to promote the educational programs of state-supported institutions of higher education in Texas by authorizing the establishment and operation of a cooperative system for communication and information retrieval and transfer between the institutions and between the institutions and private educational institutions, industry, and the public. The system, employing two-way, closed-circuit television and other electronic communication facilities, is to provide a means of effecting the interchange of ideas, talents, faculties, libraries, and data processing equipment and a means of carrying out an approved program of instructional television.

Section 2. DEFINITIONS. In this Act unless the context requires a different definition

(1) "association" means the Western Information Network Association or any other regional network association created and named by the Coordinating Board, Texas College and University System;

(2) "member" means one of the institutions of higher education which compose an association;

(3) "associate member" means an organization other than an institution of higher education admitted to associate membership in an association;

(4) "board" means the board of directors of an association;

(5) "director" means a member of a board.

SUBCHAPTER B. THE WESTERN INFORMATION NETWORK ASSOCIATION

Section 3. ASSOCIATION CREATED. (a) The Western Information Network Association is created. It is an agency of the state composed of the following state-supported member institutions of higher education: Amarillo College, Angelo State College, Clarendon Junior College, Frank Phillips College, Howard County Junior College, Midwestern University, Odessa College, South Plains College, Sul Ross State College, Texas Technological College, Texas Western College, and West Texas State University.

(b) The board by a majority vote may admit other state-supported institutions of higher education to membership in the association upon approval by the Coordinating Board, Texas College and University System.

(c) The board by unanimous vote may admit private institutions of higher education to membership in the association upon approval by the Coordinating Board, Texas College and University System.

(d) The board by unanimous vote may admit other organizations to associate membership in the association.

Section 4. BOARD OF DIRECTORS. The association is governed by a board of directors. The chief administrative officer or such person designated by the chief administrative officer of each institution of higher education holding membership in the association shall serve as a director of the board. Such service on the board is an additional duty of employment of the chief administrative officers or such persons designated by the chief administrative officers of state-supported institutions and not an additional position of honor, trust, or profit. The Legislature finds that this service is necessary in accomplishing the purpose of this Act; is compatible with their employment; and will benefit the educational program of the institution and of the state.

Section 5. DIRECTOR'S EXPENSES. A director is entitled to receive reimbursement for actual expenses incurred in attending meetings of the board and in attending to the business of the association which is authorized by a resolution of the board.

Section 6. MEETINGS OF THE BOARD. (a) The board shall hold a meeting at least once each quarter and may hold meetings at other times at the call of the chairman of the board or at the request of a majority of the other directors.

(b) A majority of the membership of the board constitutes a quorum at a meeting of the board.

(c) Action may be taken by the board by the affirmative vote of the majority of the directors present at a meeting at which a quorum is present.

Section 7. CHAIRMAN AND VICE CHAIRMAN OF THE BOARD. The board shall select a director to serve as chairman and a director to serve as vice chairman of the board. The chairman shall preside at meetings of the board. If the chairman is not present, or is unable to act, the vice chairman shall preside at the meeting.

Section 8. EMPLOYEES. The board may employ a general manager who shall serve as the chief executive officer of the association. The board may employ other employees it considers necessary in carrying on the association's duties and functions.

Section 9. DELEGATION OF AUTHORITY. The board may delegate any of the powers, duties, or functions of the association to the general manager or to any other employee.

Section 10. BOND OF AN OFFICER, AGENT, OR EMPLOYEE.
(a) The general manager, and every other agent or employee of the association charged with the collection, custody, or payment of any money of the association shall execute a bond conditioned on the faithful performance of his duties.

(b) The board shall approve the form, amount, and surety of the bond.

(c) The surety may be a surety company authorized to do business in this state.

(d) The association shall pay the premium on the bond.

Section 11. POWERS AND DUTIES. (a) The association may acquire, operate, and maintain, or obtain by contracting with any communications common carrier in accordance with its tariffs, a multichannel, two-way communications system, including closed circuit television, linking classrooms, libraries, computer facilities, and information retrieval systems at the member-institutions.

(b) The association may acquire, operate, and maintain, or obtain by contracting with any communications common carrier in accordance with its tariffs, any facility, in addition to that described in Subsection (a) of this section, which the board considers necessary or desirable in carrying out the purposes of this Act.

(c) The association may interchange educational information with private educational institutions, school districts, the United States Government and other parties engaged in education or participating in educational projects, and use the facilities of the association only in the exchange, retrieval and transfer of information and the interchange of approved course offering and instruction between member-institutions and other parties engaged in education or participating in educational projects.

Section 12. GIFTS AND GRANTS. The association may accept gifts, grants, or donations of real or personal property from any individual, group, association or corporation. It may accept grants from the United States Government subject to the limitations or conditions provided by law.

Section 13. FUND CREATED. The Information Network Association Fund is created as a special fund in the state treasury. All money deposited in the treasury by the Western Information Network Association or any other regional network association created by the Coordinating Board, Texas College and University System, shall be credited to the special fund and disbursed as provided by legislative appropriation.

Section 14. RULES AND REGULATIONS. The association shall adopt and publish rules to govern the conduct of its business.

Section 15. PRINCIPAL OFFICE. The board for the Western Information Network Association shall maintain its principal office in Lubbock, Texas, at Texas Technological College. The boards for other regional information network associations created by the Coordinating Board, Texas College and University System, shall maintain their principal offices at locations designated by the Coordinating Board, Texas College and University System.

Section 16. FACILITIES. Each member-institution shall furnish suitable space to the association for a classroom-studio, a lecture-studio, and a control room. It may also furnish any additional physical plant facility needed by the association in carrying on its functions at the institution.

SUBCHAPTER C. OTHER INFORMATION NETWORK ASSOCIATIONS

Section 17. DESIGNATION OF REGIONS. (a) In addition to the Western Information Network Association, the Coordinating Board, Texas College and University System, shall at such times as such board shall determine, divide the state into information network association regions consisting of state-supported institutions of higher education located within geographical boundaries prescribed by the coordinating board.

(b) The coordinating board shall give due consideration to the geographical proximity and number of institutions of higher education to be included within a proposed region.

Section 18. CREATION. (a) The Coordinating Board, Texas College and University System, shall create and name an information network association within an information network region if

(1) a majority of the institutions of higher education within a region apply to create an association; and

(2) the institutions applying show good cause for creating an association.

(b) The Coordinating Board, Texas College and University

System, may not create more than one information network association in an information network region.

(c) Each information network association created is an agency of the state.

Section 19. APPLICABILITY. Except for Subsection (a), Section 3, of Subchapter B, the provisions of Subchapters A and B of this Act shall apply to any additional information network association created by the Coordinating Board, Texas College and University System.

SUBCHAPTER D. TEMPORARY PROVISIONS

Section 20. SEVERABILITY. If any provision of this Act or the application thereof to any person or circumstance is held invalid, such invalidity shall not affect other provisions or applications of the Act which can be given effect without the invalid provision or application, and to this end the provisions of this Act are declared to be severable.

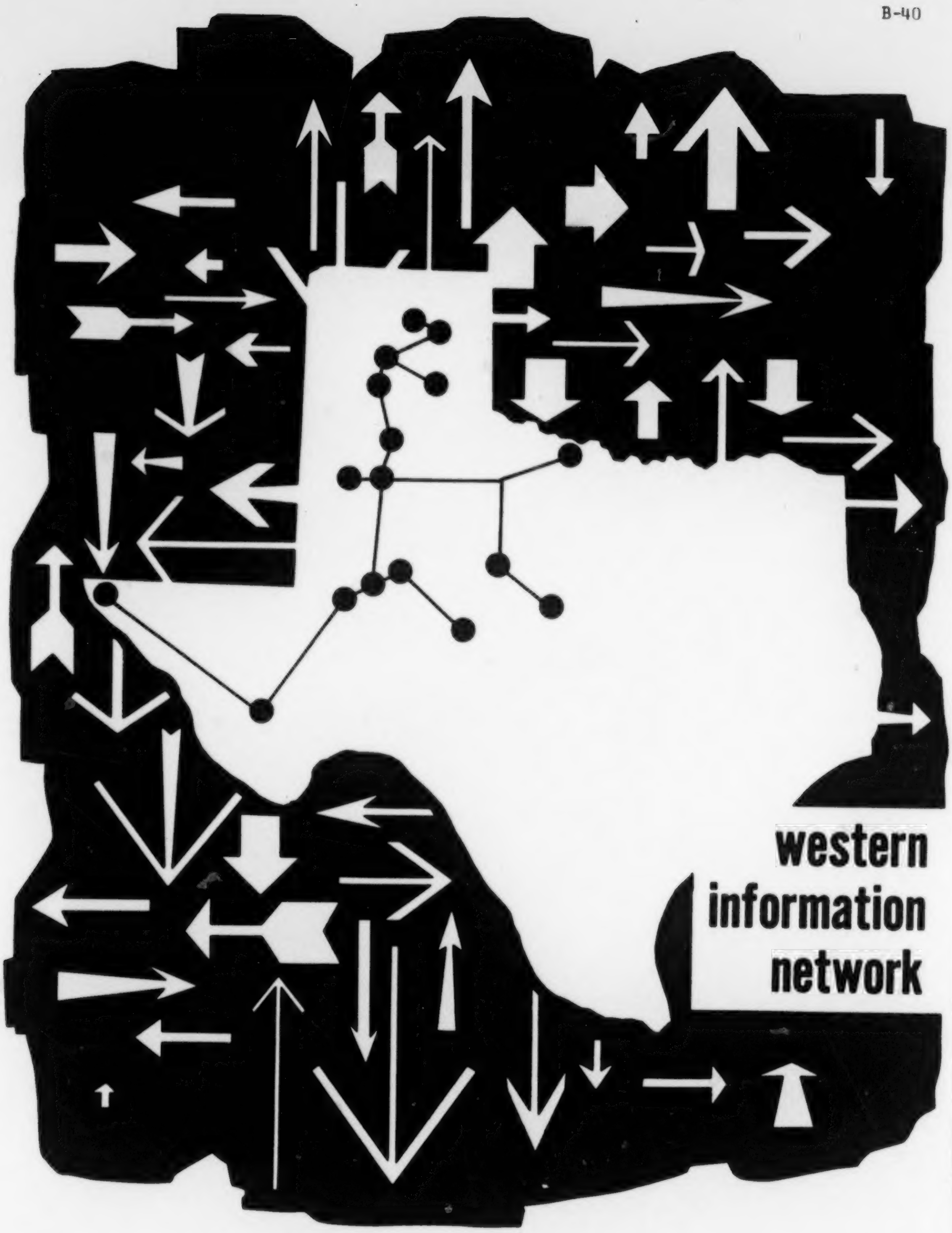
Section 21. EMERGENCY. The importance of this legislation and the crowded condition of the calendars in both houses create an emergency and an imperative public necessity that the Constitutional Rule requiring bills to be read on three several days in each house be suspended, and this Rule is hereby suspended.

Passed by the House on April 28, 1967 by a non-record vote; House concurred in Senate amendments on May 12, 1967 by a non-record vote.

Passed by the Senate, as amended on May 11, 1967 by a viva-voce vote.

Approved by the Governor on May 27, 1967.

Effective August 28, 1967, 90 days after adjournment.


western
information
network

The Western Information Network is a cooperative endeavor of eighteen of the institutions of higher learning in the vast West Texas region. Its goal is to provide business, industry, communities and educational institutions with an effective system for communication and information transfer.

The intent is to forge combined efforts of institutions of learning into one tremendous force of maximum quality, achieving institutional enrichment, enhanced relationships between industries and colleges, and greatest public service.

Primary operations of the Western Information Network will be through a multi-channel, two-way communication system including closed circuit television, which will link classrooms, libraries, computer facilities, and information retrieval systems at the eighteen points, into one immense knowledge-dynamics system which all may use most efficiently, economically, and effectually.

The system will greatly enhance cooperative interchange between education and industry, immeasurably expanding it at minimum cost. With the staggering increase in volume of all categories of information, and the great broadening in the scope of educational demands and goals, a manageable system for meeting these needs must be devised. New procedures and new ideas will inevitably find expression in such a conjoined venture.

The creation of this communication network will provide . . .

institutional enrichment

to the institutions of higher learning . . . instantaneous interchange of faculty and students . . . graduate opportunities for faculty development . . . extensive programmed instruction capability . . . special lectures . . . outstanding short courses . . . improved professional status and enhanced quality of teaching . . . expanded library resources . . . sharing of information retrieval systems . . . increased computational capabilities . . . special knowledge of scholars and researchers transmitted to soaring numbers of students . . .

business and industry

to business and industry . . . a practicable answer to the essential process of continuing education . . . closer association with institutions of higher learning . . . effective multi-computer utilization . . . rapid information retrieval . . . expanded graduate work . . . rapid dissemination of the end products of research in all fields, tremendously simplified and speeded, resulting in economic growth, higher employment, and an improved competitive position in world markets . . .

public service

to the communities . . . local accessibility of studies for elementary and secondary educators . . . greatly enhanced library facilities . . . improved knowledge and practice in the realms of public health, first aid and safety . . . ready availability of technical courses leading to certificates . . . specialized subject matter . . . job training programs . . . improved means for career scholarship . . . increased potential for industrial development . . . greater opportunity for institutions and communities to work together to their common advantage.

PARTICIPANTS

abilene christian college
abilene

amarillo college
amarillo

angelo state college
san angelo

clarendon college
clarendon

frank phillips college
borger

hardin-simmons university
abilene

howard county junior college
big spring

howard payne college
brownwood

lubbock christian college
lubbock

midwestern university
wichita falls

mcmurry college
abilene

odessa college
odessa

south plains college
levelland

sul ross state college
alpine

texas technological college
lubbock

the university of texas at el paso
el paso

wayland baptist college
plainview

west texas state university
canyon

Network facilities and operations for the state-supported institutions are provided by Western Information Network Association, an agency of the State of Texas, created in 1967, House Bill 692, 60th Legislature.

Network facilities and operations for the private institutions are provided by Western Information Network, Inc., a non-profit corporation.

THE KNOWLEDGE NETWORK

R. F. SCHENKKAN AND
JOHN W. MEANEY

**A Report to the Coordinating Board,
Texas College and University System,
on the Feasibility of a State Educational
Communications System in Texas**

NOTE: This full report was handed out at the meeting, but for purpose of economy is not duplicated herein.

APPENDIX B.4

STATEWIDE STUDY GROUP ON LIBRARY NETWORKS
FIRST MEETING - FEBRUARY 18, 1969

MEETING NOTES

Mr. Richard Waters summarized the partial results that have been received by the Texas Library Association Statewide Network Survey Committee. Basis of the survey was those covered in Richard Perrine's survey for the Pre-Conference Reference Round Table of the Texas Library Association in 1968. Dick Waters commented that, in his estimation, the lack of a definition of networks caused the survey to cover what may be termed cooperative ventures.

The results are being categorized into five groups as follows: 1. Local networks involved in one to three Major Resource Center areas, as defined by Texas State Library; 2. Statewide networks, with few libraries as members; 3. Regional networks defined as Texas and at least one other state, with headquarters in Texas; 4. Regional networks of at least one other state and Texas, with headquarters in the other state; 5. National networks. Generically the committee is trying to define the holdings within the different areas: 1. MRC; 2. Texas Library; 3. Region into which Texas feeds data.

The questionnaire is attached in the appendix of these notes.

One question covering the growth from last year painted the picture that there was no last year in the case of many of these networks. Dick Waters commented on the ranging answers to the questions such as: Does the network perform "reference" or refer the patron to another network? There was no consistency in 92 percent of the answers. However, one hopeful sign was the indications from the field of Medical Science, where there are not networks, but they are well organized.

At present, Dick Waters can define eight local networks, five state, four regional with Texas headquarters, and five regional with out-of-state headquarters. The committee has not attempted to cover the national networks at the present time.

Dick Waters suggested that the next survey be financed so that the survey can be carried on on a person-to-person basis, with a glossary of terms and identification of library organizations. He felt because of a lack of communication some of the responses were worthless.

During the commentary, it was pointed out that most librarians are interested in cooperative ventures, cooperative location files, plus service capabilities of these networks, their policies and prices.

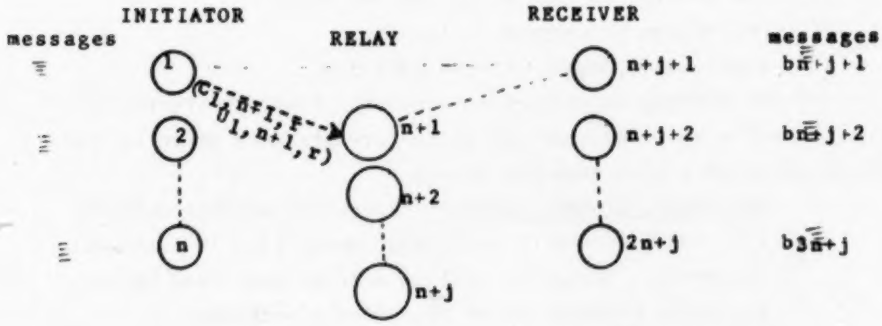
Dick Perrine commented that the characteristics of a formal network were that it was a communication media, bi-directional with a directory, and switching capabilities. Networks usually fall into the following groupings: Educational, library and professional societies. What is needed is the identification of class of equipment, form of data, function and financial support of the network, and whether or not the library can piggyback.

Maryann Duggan pointed out that there four types of networks: Homogeneous-vertical networks, Heterogeneous-vertical networks, Homogeneous-horizontal networks and Heterogeneous-horizontal networks.

LIBRARY NETWORKS MODEL - Dr. Richard Nance

A network is defined as consisting of vertices (entities, libraries) and arcs (the action between the vertices). The message model presented has two modes of behavior for libraries: Initiators (senders of messages), and Receivers. These two modes are separated for the sake of the mathematical model, though both exist in an actual library. There also exists a subset of libraries which act as relay libraries (also defined as switching centers) having material such as finding guides, Union Catalogs, TWX and Telex, which in theory never initiate, but act strictly as relay libraries.

The Initiator library (1) has some number of messages it is going to send, and the Receiver library (n+j+1) has some number of messages that it is going to receive (bn+j+1). Using the channel through relay library (n+1), the Initiator library will discover the Capacity $(C_1, n+1, r)$ of channel r, and the Utility $(U_1, n+1, r$ of the channel r (also r=k in some parts of his discussion).



X= number of messages from library i over k channel to j library
X= number of messages
i= 1,2, ...n
j= n+1, n+2, ... n+j
k= channel
U= utility of channel r
C= capacityof channel r

$$\sum_{i} \sum_{j} \sum_{k} = X_{ijk}U_{ijk}$$

What we will attempt to do is maximize i, j, and k, which graphically will be defined as the peak of the utility of a channel in ratio to the number of messages sent, and how sent.

This Mathematical Model is a Multi-commodity, capacitated, multi-linked network on messages. One on documents is a location problem and has not been solved.

During the morning session, Maryann Duggan listed the items of consideration of the Statewide Study Group on Library Networks.

1. Identify existing library networks
2. Define the meaning of networks
3. Definition of services
4. Quantitative identification of network characteristics
5. Lack of "locator guides"
6. Establishment of priorities
7. Conflict: publication vs. cooperation
8. Overlapping of networks
9. Level of switching

10. Designation of specialization and roles
11. Definition of geographic levels
12. Problems of organizational behavior.

In the morning and afternoon sessions, various networks were identified and a short history and their services were given by their representative or a knowledgeable person.

1. THE PUBLIC LIBRARY NETWORK: is a hierarchical network with three levels of switching, which ties in nationally in theory. Actually still on a trial and error basis. You could classify it as homogeneous vertical.
2. INTER-UNIVERSITY COUNCIL (IUC): is a local network limited by charter to the six counties in the Dallas-Fort Worth area, with a private line communication link of one message at a time, connecting eight college libraries for the purposes of interlibrary loans and exchange of photocopies. On a contract basis, it is interfaced with Industrial Information Services (IIS), and on a manual basis to Texas Information Exchange (TIE). Col. Reiff classifies his IUC as homogeneous-horizontal.
3. TEXAS EDUCATION MICROWAVE NETWORK (TEMP): is an instructional education network involving seven institutions. It is a broadband microwave set-up with a spare channel or two which could be used for interlibrary loan purposes if it had teletype or facsimile transmission equipment. Its members are St. Mary's, Trinity, Southwest State, University of Texas, St. Edward's, and two others.
4. WESTERN INFORMATION NETWORK (WIN): Interconnects 18 universities to share resources using a microwave system. Primary operations of the Western Information Network will be through a multi-channel, two-way communication system which will link classrooms, libraries, computer facilities and information retrieval systems at the 18 points. House Bill 692 of the 60th Legislature was quoted, and is attached at the end of these notes.

5. SOUTHEAST TEXAS INFORMATION NETWORK ASSOCIATION (SETINA): is based on the in-school GRETA covering 20 counties in the Houston area. Though the medical schools are not included, it consists of most of the major universities and colleges in that area. They will have a meeting Friday, which will firm many of the future plans.
6. EDUCATIONAL SERVICE CENTERS (ESC): consists of 20 regional centers operating autonomously, without local tax support, but closely related to Texas Education Agency. Mary Boyvey explained that those concerned were watching the Yarbrough Bill in the national Congress for possible amendment which will create capabilities of acquiring technological equipment, training of personnel, software and hardware. Janice Kee went on to explain that hopefully this would create channels of communication, and real time computer center for these media centers through contract with NASUM.
7. TEXAS COUNCIL ON HEALTH SCIENCE LIBRARIES (TCHSL): is the exchange through which 14 medical institutions exchange library information. The Council is becoming concerned with serving outside contacts, and even outside the medical profession. Wilson Fahlberg pointed out that the medical libraries in this region have a $10,000 grant to update the N. Y. library list (separate from MEDLARS) but the regional center has not been designated. One MUST is the interfacing of these medical information systems with those networks covering physics and mathematics. Another problem is the training of the hospital librarian to ask for material properly. It is an individual policy whether or not the medical school serves the individual practitioner.
8. TEXAS COORDINATING BOARD: thinks it is possible to have four regional information systems. Forrest Ward as the TCB representative was not ready to commit the Board to any plans.

As Janice Kee pointed out, librarians need to be in the position to say "this is what we need," but they haven't taken this charge.

Ed Montgomery spoke of the N. Y. libraries network with facsimile transmission until dollar feasibility raised its head. He suggested that: 1. We find what we want to do with a network, and 2. Find out if it is worth doing before the taxpayer's revolt gets here.

(Part of the discussions have been omitted, particularly that revolving around Dr. Nance's presentation of the Mathematical Model, where fast and furious comments were being made by the participants on the multi-commodity, capacitated, multi-linked network.)

APPENDIX C

REFERENCE ROUND TABLE AND BEHAVIORAL MODEL

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APPENDIX C.1
REGISTRANTS AT REFERENCE ROUND TABLE SECOND PRE-CONFERENCE INSTITUTE
March 1969
Houston

(Home addresses in parentheses where identifiable as such)

1. Abrams, Fred
Reference Librarian
Rice University
1832 W. Main, Houston 77006

2. Alcorn, Maxine
Reference Librarian
Houston Public Library
500 McKinney, Houston

3. Alley, Barbara (Mrs.)
Children's Librarian
Pasadena Public Library
1201 Minerva, Pasadena 77502
(4001 Crawford #181R)

4. Allmand, Linda
Branch Head
Dallas Public Library
3039 South Lancaster, Dallas 75216

5. Anderson, Sister Joseph Marie
Librarian
University of Dallas
Route 2, Box 4, Irving 75060

6. Anglin, Irene (Mrs.)
Branch Librarian
Parkdale Branch Library
4444 Golihar, Corpus Christi 78411

7. Armstrong, Geneva M. (Mrs.)
Librarian
Euless Public Library
201 Ector Drive, Euless 76039

8. Ashford, Daisy
Cataloger
Fondren Library, Rice University
5311 Valerie, Bellaire 77401

9. Atkinson, Marjorie
Reference Librarian
La Retama Public Library
505 North Mesquite, Corpus Christi
78401

10. Aull, Sara (Miss)
Science Librarian
University of Houston
Cullen Boulevard, Houston 77004

Bailey, Joe H. 11.
Associate Director, Public Services
North Texas State University
Denton 76203

Barnett, Jacqueline 12.
Basic Division
Texas A & M University Library
College Station 77840

Barnstead, Rosemarie 13.
Librarian
Annunciation Library
1201 Hyde Park, Houston (?)

Bell, Valerie 14.

Bennett, Betty 15.
Reference & Research Librarian
Stephen F. Austin State College Library
Nacogdoches (1525 Walnut, Nacogdoches)

Bichteler, Julie (Mrs.) 16.
Lecturer
Graduate School of Library Science
University of Texas at Austin 78712

Bikshapathi, Adepu 17.
Library Student
North Texas State University
Denton (316 Fry, Denton)

Blum, Sarah (Mrs.) 18.
Head, General Reference Department
Fort Worth Public Library
Fort Worth (2504 Dean Lane, 76107)

Boothe, Gazella (Mrs.) 19.
Assistant Reference Librarian
W. R. Banks Library
Prairie View A & M, Prairie View

Boudreaux, J. B. (Mrs.) 20.
Librarian
Hockley County Memorial Library
Austin & Ave. H., Levelland 79336

21. Bowden, Ann (Mrs.)
Assistant Director
Austin Public Library
P. O. Box 2287, Austin 78767

22. Brannen, Dee Dee (Mrs.)
3413 Cornell
Dallas, Texas 75205

23. Brewster, John W.
Interlibrary Loan/Asst.
Periodicals Librarian
North Texas State University, Denton
76203

24. Brown, Hugh A.
Director of the Library
Hardin-Simmons University
Abilene, Texas 79601

25. J. James Brown
Librarian, Carole M. Anderson Library
M . B. Smiley High School
10273 E. Houston, Houston 77021

26. Burns, Dorothy (Mrs.)
Assistant Reference Librarian
Sterling Municipal Library
Public Library Avenue, Baytown 77520

27. Busch, Valeria (Mrs.)
Librarian
Friench Simpson Mem. Library
Drawer 269, Hallettsville 77964

28. Castle, Lavelle
Basic Division
Texas A & M Univ. Library
College Station 77840

29. Chadwell, Patricia
Head, Southwest & Genealogy Dept.
Fort Worth Public Library
2966A McCart, Fort Worth

30. Chamberlain, Enrique
Librarian
El Centro College
Main and Lamar, Dallas

31. Chesnut, Barbara (Mrs.)
Cataloger
Brooks County Public Library
Drawer L, Falfurrias 78355

Church, Ginger (Miss) 32.
Student, Graduate School of Library Science
University of Texas at Austin
Austin, Texas (2017 C Red River)

Claxton, R. W. 33.
Head, Literature & Biography Department
Houston Public Library
500 McKinney Avenue, Houston 77002

Clayton, Marguerite V. 34.
Assistant Professor
TWU School of Library Science
Denton, Texas 76204

Colburn, Frances (Mrs.) 35.
Technical Librarian
Celanese Technical Center Library
P. O. Box 2768, Corpus Christi

Collier, Jean P. (Mrs.) 36.
Librarian
Houston Academy of Medicine Library
Texas Medical Center, Houston

Connelley, Melba J. 37.
Librarian, Texas Electric Service Co.
Post Office Box 970
Fort Worth 76101

Cook, Kathleen (Mrs.) 38.
City Librarian
Orange Public Librarian
300 North Fourth Street, Orange

Covington, Pamela Smither (Mrs.) 39.
Reference Librarian
Houston Public Library
Houston, Texas (8216 Fondren Rod. 77036)

Cragin, Shelah-Bell (Mrs.) 40.
Assistant Director
El Paso Public Library
501 N. Oregon, El Paso 79901

Crandall, Dorothy (Mrs.) 41.
First Assistant
Moody Branch, Houston Public Library
1242 LaMonte Lane, Houston 77018

Crenshaw, Jan 42.
Special Grant - Clerical
Texas Christian University Library
3009 Greene Avenue, Fort Worth

43. Cunningham, Nell (Miss)
Assistant Librarian
Gates Memorial Library
317 Stilwell, Port Arthur 77640

44. Cutley, Mercedes (now Mrs. Bierman)
Library Services Manager
John Wiley & Sons, Inc. Publ. Co.
605 Third Avenue, New York 10016

45. Dabek, Joan (Mrs.)
Circulation Assistant
University of Houston
8234 Garden Parks, Houston

46. Davies, Margaret (Mrs.)
Reference Librarian
Rosenberg Library
823 Tremont, Galveston 77550

47. Davis, Sarah (Mrs.)
Library Director
Alice Public Library
Alice, Texas

48. De La Cerda, Rosa
Librarian
Eagle Pass Public Library
Drawer 1248, Eagle Pass 78852

49. Devers, Howard L.
Circulation & Interlibrary Loan
Howard Payne College
Brownwood, Texas 76801

50. Dollar, Betty Jo
Reference Librarian
Houston Public Library
500 McKinney, Houston

51. Donahue, Mary Kaye (Miss)
Assistant Director
Lubbock City-County Libraries
Lubbock, Texas

52. Duggan, Maryann (Miss)
Director, Industrial Information Svcs.
Southern Methodist University
Dallas, Texas 75222

53. Dunne, Patricia (Miss)
Assistant Librarian
Transcontinental Gas Pipe Line Corp.
P. O. Box 1396, Houston 77001

Durden, Adelle (Mrs.) 54.
Branch Librarian, Oak Forest Branch
Houston Public Library
1349 W. 43rd, Houston 77018

Dwyer, Charles L. 55.
Coordinator of Reference Services
Sam Houston State College
Box 2085 S.H. Sta., Huntsville 77340

Dwyer, M. J. 56.

Dyess, Dessie Mae (Mrs.) 57.
Catalog Librarian
West Texas State University
Canyon, Texas

Dyess, S. W. 58.
Assistant to the Librarian
West Texas State University
500 Holman Lane, Canyon

Dyke, James (Dr.) 59.
Director of Libraries
Texas A & M University
College Station 77843

Easterly, Joe A. 60.
Library Director
Jay-Rollins Library
Abilene, Texas 79605

Eden, Mary L. 61.
Assistant Librarian
Carnegie Public Library
111 S. Main, Bryan 77801

Edwards, Aliyah (Mrs. von Nussbaumer) 62.
Technical Librarian
Dresser-Magcobar Research Library
3133 Buffalo Spwy., Houston

Edwards, Andrea Y. 63.
Interlibrary Loans Librarian & Reference
Houston Public Library
500 McKinney Avenue, Houston

Eggert, Meris Morrison 64.
Curriculum & Reference Librarian
Texas Southern University
3201 Wheeler, Houston 77004

65. Estok, Rita (Mrs.)
Assistant Research Librarian
Texas A & M University
College Station 77840

66. Eyth, Mary Jo
Adult Librarian, Literature-Biography
Houston Public Library
500 McKinney, Houston

67. Fair, Lucinda
Librarian
Turner Memorial
8301 W. Montgomery, Houston

68. Fingerla, R. P. (Mrs.)
Desk Assistant
Meyer Branch, Houston Public Library
5134 Lymbar, Houston 77035

69. Foreman, Ann
Circulation Assistant
University of Houston
6503 Flamingo, Houston

70. Foster, Mary K.
H.I.S.D.
Non-Public Title I Library
Houston

71. Foster, W. L. (Mrs.)
Reference Librarian
Brazoria County Library
Old Courthouse, Angleton

72. Franklin, Kay (Mrs.)
Graduate School of Library Science
University of Texas at Austin
Austin

73. Frazer, Georgia A.
Maps & Micromaterials Librarian
Rice University, Fondren Library
Houston 77001

74. Friedman, Ben (Mrs.)
Librarian
Congregation Beth Yeshurun
4525 Beechnut
Houston

75. Gable, Elizabeth (Mrs.)
Technical Processing Librarian
La Retama Public Library
505 N. Mesquite, Corpus Christi 78401

Garcia, John 76.
Acquisitions Librarian
Fondren Library, Rice University
Houston

Garland, Carol 77.
Branch Librarian
Houston Public Library
11203 Caribbean, Houston

Gayer, Mary (Mrs.) 78.
14330 Memorial
Houston 77024

Gervasi, Mildred (Mrs.) 79.
Librarian, Cody Memorial Library
Southwestern University
1612 Williams Dr., Georgetown 78626

Gilbert, Annie May 80.
Branch Head
Dallas Public Library
Dallas

Gill, Dorothy B. (Mrs.) 81.
First Assistant
Jefferson County Library
335 Franklin, Beaumont 77701

Gindorf, Jan (Mrs.) 82.
Assistant Librarian
Walter Branch, Houston Public Library
7660 Clarewood, Houston

Gohmert, Janice (Miss) 83.
Head, West Branch
Fort Worth Public Library
3855 Camp Bowie #7, Fort Worth 76107

Goldman, Marcene (Mrs.) 84.
Technical Librarian
Texaco, Inc.
Box 425, Bellaire, 77401

Goodman, Helen C. (Mrs.) 85.
Acquisitions Librarian
El Paso Public Library
501 N. Oregon, El Paso

Graves, Ann (Mrs.) 86.
Director, Reference Division
Texas State Library
Austin, Texas

87. Greear, Yvonne E.
Reference Librarian
University of Texas at El Paso
El Paso 79999

88. Grisham, Edith P. (Mrs.)
Librarian, Business Technology Dept.
Houston Public Library
500 McKinney Avenue, Houston

89. Hall, John G.
College Librarian
Austin College
Sherman 75090

90. Halloran, Helen K. (Mrs.)
Branch Librarian
Greenwood Branch Library
4044 Greenwood Dr., Corpus Christi 78416

91. Hamilton, Louise Bridge (Mrs.)
Head Librarian
Brooks County Public Library
Drawer L, Falfurrias 78355

92. Hancock, Margaret A. (Mrs.)
Reference Libearian
Texas A & I University
Kingsville, Texas

93. Harka, Marguerite (Mrs.)
Librarian
Silsbee Public Library
Santa Fe Park, Silsbee 77656

94. Harper, Alvin E.
Reference Lib., Science & Industry
Dallas Public Library
1954 Commerce, Dallas 75201

95. Harper, Anne (Mrs.)
Reference Assistant
Gates Memorial Library
317 Stilwell, Port Arthur 77640

96. Harris, Jeanette H. (Mrs.)
Head, History, Soc. Sci. & Gen. Ref.
San Antonio Public Library
371 Readwell Dr., San Antonio 78220

97. Herring, B. C.
Assistant Professor
Graduate School of Library Science
University of Texas at Austin
(1510 Glencrest 78723)

98. Hess, Jean (Mrs.)
1509-A West 35th Street
Austin 78703

Hewett, Chlorys E. (Miss) 99.
Adult Librarian
Houston Public Library, Heights Branch
1400 Bonnie Brae, Houston 77006

Hickerson, Alice (Mrs.) 100.
Assistant Librarian, Research Medical Lib.
U. of Texas M. D. Anderson Hospital
Texas Medical Center, Houston 77025

Hoke, Virginia P. (Mrs.) 101.
Head, Southwest Reference Department
El Paso Public Library
501 N. Oregon, El Paso 79901

Holmes, Beverly (Mrs.) 102.
SCAS Reference Librarian
SMU Science Library
Dallas 75222 (3430 Cloverdale Ln., 75234)

Howard, John F. (Lynn) 103.
Peat, Marwick, Mitchell & Company
1400 One Main Place
Dallas 75250

Howard, Mattie (Mrs.) 104.
Librarian
Butt-Holdsworth Memorial Library
505 Water Street, Kerrville

Huff, Martha E. (Mrs.) 105.
Assistant Librarian
Murry H. Fly Library, Odessa College
Box 3752, Odessa

Hughes, Sue Margaret 106.
Order Librarian
Baylor University Library
Waco

Hull, Melicent T. (Mrs.) 107.
Asst. Reference Librarian
Pasadena Public Library
1201 Minerva, Pasadena 77502

Hunt, Jerry E. 108.
Librarian
Denison Public Library
231 N. Rusk Ave., Denison

Hurst, Bernice 109.
Branch Librarian
Houston Public Library
Rt. 2, Box 118A, Angleton 77515

Hyman, Ferne B. 110.
Asst. Gifts and Exchange Librarian
Fondren Library, Rice University
Houston

111. Ingram, Virginia (Mrs.)
Branch Librarian
Walter Branch, Houston Public Lib.
7660 Clarewood, Houston 77036

112. Irwin, Virginia P. (Mrs.)
Reference Librarian
Our Lady of the Lake College
114 Rosemary, San Antonio 78209

113. Jackson, Anna B. (Mrs.)
Acting Reference Librarian
Texas Southern University
3201 Wheeler, Houston 77004

114. Jackson, Gene H. (Mrs.)
Interlibrary Loan Librarian
University of Houston
3800 Cullen Blvd., Houston 77004

115. Jacobs, Louis
Houston Post Company
Houston

116. Janaske, Paul C.
Chief, Lib. & Inf. Branch
Div. of Library Programs
Office of Education
Dept. of HEW, Washington 20202

117. Johnson, Carole (Miss)
Hampton-Illinois Branch Library
2210 West Illinois
Dallas

118. Johnson, G. T.
Chief Librarian
Bishop College
Dallas

119. Johnson, Herbert M.
Greenwood Press, Inc.
New York, N. Y.

120. Johnston, Maxine (Miss)
Reference Librarian
Lamar State College of Technology
Box 10021 L.T. Sta., Beaumont 77705

121. Jones, Patricia
Librarian
Friendswood Library
109 Willowick, Friendswood

Kazee, Nancy W. 122.
Personnel Department
Houston Public Library
500 McKinney, Houston

Kee, S.Janice (Miss) 123.
Library Services Program Officer
Dept. of HEW, Region 7
1114 Commerce, Dallas 75202

Kelly, Cleo B. 124.
Acquisitions Librarian
Stephen F. Austin State College
Nacogdoches 75961

Kennerly, Sarah Law (Dr.) 125.
Professor of Library Service
North Texas State University
Denton 76203

Kruse, Paul (Dr.) 126.
Dept. of Library Service
North Texas State University
Denton 76203

Kuo, Margaret 127.
Acting Law Librarian
Texas Southern University
3201 Wheeler, Houston 77004

Kuo, Richard D. 128.
Circulation Librarian
Texas Southern University
3201 Wheeler, Houston 77004

LaCook, Nancy 129.
Assistant Reference Librarian
Rosenberg Library
823 Tremont, Galveston

Ladner, Christine Hall 130.
Administrative Assistant
Houston Acad. of Medicine Lib. for Texas
Medical Center, Houston 77025

Laird, R. 131.
Librarian
Dickinson Library
4001 Highway 3, Dickinson

Lappala, June L. (Mrs.) 132.
Requisitions Librarian
Rice University Library
Houston

133. Lauten, Ellen New
Librarian
Bowie School
7501 Curry Rd., Houston 77016

134. Lawrence, Gertie Mae (Mrs.)
Librarian
T.L.L. Temple Memorial Library
Box 608, Diboll 75941

135. Laws, Marian C. (Mrs.)
Student, G.S.L.S.
University of Texas at Austin
Austin (1210 Windsor Rd.#110,78703)

136. Ledlow, Elaine (Mrs.)
Professor, Dept. of Library Service
North Texas State University
Denton 76203

137. Lentz, Lois (Mrs.)
Acting Librarian
Montgomery County Library
Box 579, Conroe 77301

138. Lewis, Frances (Mrs.)
Cataloger & Reference Librarian
Sterling Municipal Library
Public Library Ave., Baytown 77520

139. Lewis, S. Madge
Head Librarian
Townsend Memorial Library
Box 767, Belton 76513

140. Lodge, Margaret Rose
Librarian
South Houston H.S.
3820 S. Shaver, S. Houston 77587

141. Loomis, Elizabeth M. (Mrs.)
Asst. Science Librarian
Science Division, Univ. of Houston
Houston (2016 Main St. #2415,77002)

142. Loomis, Louise
Literature Chemist
Mobil Chemical Company
Beaumont Laboratory, Beaumont

143. Lowry, Fae (Mrs.)
Acting Library Director
Tyrrell Public Library
Box 3827, Beaumont 77704

MacDonald, Zula Zon (Mrs.) 144.
Chairman, Dept. of Library Science
Baylor University
Box 6297, Waco 76706

Mair, Verna (Mrs.) 145.
School Librarian
Oleson Elementary School
12165 Vickery, Houston (?)

Manning, Kathryn 146.
Director
Irving Municipal Library
815 W. Irving Blvd., Irving 75060

Margosh, Rinette 147.
Bibliographic Assistant
University of Houston
Houston

Marsales, Rita 148.
Serials Catalog Assistant
Fondren Library, Rice University
Houston

Martin, Ann (Mrs.) 149.
Consultant
Diocese of Galveston-Houston
1700 San Jacinto, Houston 77002

Mason, Pauline M. (Mrs.) 150.
Student, G.S.L.S.
University of Texas at Austin
Austin 78712 (3400 Duval Street, 78705)

Mayers, Corinne (Mrs.) 151.
Reference Librarian
Sam Houston State College
Huntsville

McAdams, Nancy R. (Mrs.) 152.
Architecture Librarian
University of Texas at Austin
Austin 78712

McConnell, Ute 153.
Reference Librarian
Houston Academy of Medicine Library
Texas Medical Center, Houston

McElderry, Stanley 154.
Dean, G.S.L.S.
University of Texas at Austin
Box 7576 Univ. Sta., Austin 78712

155. McEnany, Helen (Mrs.)
Assistant Librarian
Bellaire City Library
5111 Jessamine, Bellaire 77401

156. McGeever, Nancy B.(Mrs.)
Assistant Head, Acquisitions Dept.
Rice University Library
Houston

157. Meador, Nancy (Mrs.)
Assistant Librarian
Lee College
Baytown

158. Miller, Hallie (Mrs.)
Librarian
Temple Public Library
101 N. Main, Temple 76501

159. Miller, Virginia (Mrs.)
Librarian
Bellaire City Library
5111 Jessamine, Bellaire 77401

160. Milliken, Callie Faye
Librarian
Abilene Christian College
ACC Station, Abilene 79601

161. Mintz, Marie (Mrs.)
Kendall Branch Library
Houston Public Library
14330 Memorial, Houston 77024

162. Montague, Katherine L.
Reference Librarian
George Storch Memorial Library
Trinity University, San Antonio 78212

163. Moore, Mary L.
Librarian - General Services
Humble Oil & Refining Company
Box 2180, Houston 77001

164. Moore, W.
Head Librarian
Southern Bible College
10950 Beaumont Hwy., Houston

165. Morales, Graciela (Mrs.)
Stenographer-Clerk
Brooks County Public Library
Drawer L, Falfurrias 78355

Moss, Evelyn 166.
Assistant
Meyer Branch, Houston Public Library
Houston

Moss, Julia N. (Mrs.) 167.
Catalog Librarian
Sul Ross State College
Alpine (Box 515, Marathon 79842)

Mounce, Mattie Sue (Miss) 168.
Head, Reference Department
Science Library, SMU
Dallas 75222

Murphy, Pat 169.
Community Action Librarian
Greenwood Branch Library
4044 Greenwood Dr., Corpus Christi 78416

Murphy, Virginia B. 170.
Social Sciences Librarian
University of Houston
Houston 77004

Murray, Lucille (Mrs.) 171.
Librarian
Robert T. Kleberg Public Library
4th & Henrietta, Kingsville

Neal, Frances (Mrs.) 172.
Librarian and Executive Secretary
Arkansas Library Commission
506-1/2 Center Street, Little Rock, Ark. 72201

Obenhaus, Adah May (Mrs.) 173.
Librarian
San Marcos Public Library
Box 907, San Marcos 78666

O'Keeffe, Richard L. 174.
Librarian
Rice University
Houston 77001

Oliver, Lee R. 175.
Circulation/Reference
West Texas State University
Canyon

Olsen, Wallace C. 176.
Inter-University Communications Council
9650 Rockville Pike
Bethesda, Maryland 20014

177. Owensby, Mary P. (Mrs.)
County Librarian
Harris County Public Library
2502 Crawford, Houston 77004

178. Paddock, Rita L. (Mrs.)
Associate Director, R.I.C.E.
Fondren Library, Rice University
Box 1892, Houston 77001

179. Palmer, Helen H. (Mrs.)
Chief Librarian
Lone Star Gas Company
301 S. Harwood, Dallas 75201

180. Pancake, Edwina
Student, G.S.L.S.
University of Texas at Austin
Austin

181. Pate, Tannie (Mrs.)
Assistant Librarian
Midland Public Library
Box 1191, Midland 79701

182. Patterson, Emma S. (Mrs.)
Head Librarian
The D. R. Glass Library, Texas College
2404 N. Grand Ave., Tyler

183. Pauwels, Virginia (Mrs.)
Director, Hutchinson County Library
625 North Weatherly
Borger 79007

184. Paynter, John C.
Public Services Librarian (Reference)
Wharton County Junior College
602 Pecan, Wharton 77488

185. Perrine, Richard H.
Humanities Reference Librarian
Rice University Library
Box 1892, Houston 77001

186. Peters, Carl M.
Staff Assistant, Computer Center
Southwest Center for Advanced Studies
Box 30365, Dallas 75230

187. Peters, Linda (Mrs.)
Librarian
Huntsville Public Library
1216-14th Street, Huntsville

Phillips, Thelma (Mrs.) 188.
Librarian
Pioneer Memorial Library
115 W. Main, Fredericksburg 78624

Piland, Reta D. (Mrs.) 189.
Head Librarian
Jefferson County Library
335 Franklin, Beaumont 77701

Pitts, Ann 190.
Branch Librarian
La Marque Public Library
402 Elmo,La Marque

Plate, Margaret (Mrs.) 191.
Assistant Librarian
U. of T., M. D. Anderson Hospital
Texas Medical Center, Houston 77025

Platz, James E. 192.
Associate Librarian
Texas Technological College
Lubbock

Poe, Jackie (Miss) 193.
Arkansas Library Commission
506-1/2 Center Street
Little Rock, Arkansas 72201

Pye, A. F. 194.
Head Librarian
Brazosport Junior College
Freeport, Texas

Redmon, A. J. (Mrs.) 195.
Assistant Head, Catalog Department
Fondren Library, Rice University
Houston 77001

Reindl, Ellene 196.
Cataloger
Rice University
Houston 77001

Renick, Alberta (Mrs.) 197.
Librarian
Alcon Laboratories, Inc.
6201 S. Fwy., Ft. Worth 76101

Rhine, L. G. (Mrs.) 198.
President of Unger Library Board
Unger Memorial Library
Plainview (2810 W. 18th, Plainview
79072)

199. Richardson, Harold G.
Editor
The Texas List
Box 13187, Houston

200. Richardson, Hazel (Mrs.)
Head Librarian
Carnegie Public Library
111 S. Main, Bryan 77801

201. Roberts, R. L.
Assistant Librarian
Abilene Christian College
Abilene

202. Rodell, Elizabeth
Assistant Librarian for
Technical Services
Rice University, Houston

203. Roethlesberger, June
Associate Librarian
University of St. Thomas
3812 Montrose, Houston 77006

204. Rogers, Dorothy (Mrs.)
Assistant Librarian & Reference
Brooks County Public Library
Drawer L, Falfurrias 78355

205. Sammis, Marian (Miss)
Librarian
Hermann Hospital
6411 Fannin, Houston 77025

206. Sanford, Jaspyr (Mrs.)
Science Reference Librarian
Sam Houston State College
Huntsville

207. Savage, Katrina (Mrs.)
Assistant Documents Librarian
Texas Technological College
Lubbock

208. Sawyer, Ruth (Mrs.)
Librarian, Library School Library
University of Texas
Austin (2826 San Gabriel, 78705)

209. Scannell, Rosa (Mrs.)
Reference Librarian
Lee Davis Library, San Jacinto College
8060 Spencer Hwy., Pasadena 77505

Schield, Sandra 210.
Assistant Science Librarian
University of Houston
Houston 77004

Schulz, Nancy (Mrs.) 211.
Coordinator of Reference Services
El Paso Public Library
501 N. Oregon, El Paso 79901

Schwartz, Shula (Mrs.) 212.
Manager, Central Library Services
Texas Instruments, Inc.
Box 5474, MS 925, Dallas 75222

Scott, Anita (Mrs.) 213.
Branch Librarian
Houston Public Library
4502 Briscoe, Houston 77051

Scott, Elaine 214.
Bookmobile Librarian
Robert J. Kleberg Public Library
4th & Henrietta, Kingsville

Scott, Sharon 215.
County Librarian
Fort Bend County Library
1601 Liberty, Richmond

Sharp, Camilla (Miss) 216.
University of Arkansas Technology
Box 3017
Little Rock, Arkansas

Sheel, Frieda 217.
Head, Public Services
Rosenberg Library
823 Tremont, Galveston

Shirkey, Retha A. (Miss) 218.
Reference Librarian
NASA Manned Spacecraft Center
Houston 77058

Shultz, Marie (Mrs.) 219.
Director, Field Services Division
Texas State Library
Austin (2847 Shoal Crest, Austin 78705)

Simmons, Jimmie Sue 220.
Assistant Librarian
Sul Ross State College
Box 5472, Alpine

221. Simon, Carolyn (Mrs.)
Head, Business Information Center
Austin Public Library
Austin (1910 Greenbrook Parkway)

222. Sitter, Clara (Mrs.)
Assistant Librarian
Amarillo College Library
Box 447, Amarillo (6203 Hanson Rd. 79106)

223. Sivells, Wanda (Mrs.)
Dir. Learning Ctr., J. M. Hodges Lib.
Wharton County Junior College
Wharton

224. Skinner, Lanell (Mrs.)
Assistant Librarian
Sul Ross State College
Alpine

225. Smith, Helen T.
Libn., Education-Psychology Library
University of Texas at Austin
Austin (4001 Sierra Drive 78731)

226. Smith, Roger Mae (Miss)
Reference Librarian
El Centro Junior College
Dallas 75202

227. Sprague, Julienne C. (Mrs.)
Interlibrary Loan Librarian
Texas State Library
Austin (2820 Glenview)

228. Standley, Grace H. (Mrs.)
Asst. Librarian Social Science
Sam Houston State College
Huntsville

229. Stone, Thelma
Branch Head, South Branch Library
Fort Worth Public Library
Fort Worth (112 Thornhill #10,76115)

230. Stricklin, Sammie Lou
Branch Librarian
Moody Branch, Houston Public Library
1603 Heights Blvd., Houston

231. Strong, Mary Bess (Mrs.)
Librarian
Junior High School
Falfurrias

Swafford, Ethel (Mrs.) 232.
Librarian
McAllen Memorial Library
601 Main, McAllen 78501

Sykes, Christa M. 233.
Assistant Librarian II
U. of T.,M. D. Anderson Hospital
Texas Medical Center, Houston 77025

Taylor, Jeanne M. (Mrs.) 234.
Reference Librarian
Houston Public Library
500 McKinney Avenue, Houston

Taylor, Joy 235.
Librarian
CRS Design, Inc.
3636 Richmond, Houston 77027

Taylor, Robin (Mrs.) 236.
Librarian
Southwest Center for Advanced Studies
Box 30365, Dallas 75230

Thatcher, Gertrude (Mrs.) 237.
Reference Librarian
University of Corpus Christi
Box 6010, Corpus Christi 78411

Thomas, Dorothy 238.
Department of Library Service
North Texas State University
Box 5217, N.T. Sta., Denton 76203

Thompson, Doris C. (Miss) 239.
Baylor University Department of
Library Science
Box 6297, Waco 76706

Thompson, Sara (Mrs.) 240.
Reference Librarian
Pasadena Public Library
1201 Minerva, Pasadena 77502

Thornton, Chrystal 241.
Librarian
Mesquite Public Library
300 Grubb Drive, Mesquite (5733 Goodwin)

Tolbert, Jean F. (Mrs.) 242.
Religion Librarian
Baylor University Library
Waco

243. Totten, Herman L.
Head Librarian
Wiley College
Marshall 75670

244. Ulcom, Margaret E.
Assistant Librarian
Harris County Library
2502 Crawford, Houston

245. Valdez, Anthony F.
Head Librarian
Texas Southmost College
1825 May St., Brownsville

246. Van Horn, Virginia
Director
Brazoria County Library
Old Courthouse, Angleton 77515

247. Varner, Jeannette (Mrs.)
Head of Reference
Austin Public Library
Box 2287, Austin 78767

248. Venable, F.
Librarian
Woodforest County Branch
North Shore

249. Vermeulen, June
Acquisitions Librarian
Fondren Library, Rice University
Houston

250. Vogt, Meredith
5418 Pagewood Lane
Houston 77027

251. Wagner, Frank S., Jr.
Head, Information Center
Celanese Chemical Company
Corpus Christi

252. Wagner, Virginia Bratten
Desk Assistant
Houston Public Library
Houston (3607 Murworth #1, 77025)

253. Waldron, John F.
Hydrologist & Librarian
Layne Texas Co.
Box 9469, Houston 77011

254. Walker, Carver Wallace
Librarian
Johnson Branch Library
3511 Reed Road, Houston

Wally, Anne C. (Mrs.) 255.
Assistant Librarian
Ring Branch, Houston Public Library
Houston 77055 (8835 Long Point)

Wasserman, June 256.
Head, Business & Technology Dept.
Fort Worth Public Library
9th & Throckmorton, Fort Worth 76102

Waters, Dick 257.
Chief of Branch Services
Dallas Public Library
1954 Commerce, Dallas 75201

Weathers, Barbara 258.
Reference Assistant
University of Houston
Houston (7423 Magnolia)

Weaver, Ruby 259.
Coordinator, Adult Services
Houston Public Library
Houston

Webb, David A. (Dr.) 260.
Director of Libraries
North Texas State University
Denton

West, F. C. (Mrs.) 261.
Librarian
Freeport Library
1410 West 4th Street, Freeport

West, Louis G. (Mrs.) 262.
Business Librarian
Texas Southern University
Houston

Wheeler, Marjorie W. 263.
5775 Viking
Beaumont

Whitmore, Ellie N. 264.
Assistant Reference Librarian
North Texas State University
Denton 76203 (418 Texas Street, 76201)

Wilhite, Flora R. (Mrs.) 265.
Library Director
Sterling Municipal Library
Public Library Ave., Baytown 77520

Wilkinson, Tom 266.
Librarian
El Centro Junior College
Dallas

267. Williams, Frances C. (Mrs.)
Librarian
Midland County Library
Box 1191, Midland

268. Winfree, Erma V. (Mrs.)
Librarian
Waller County Library
Hempstead 77445

269. Winfrey, Dorman H. (Dr.)
Director and Librarian
Texas State Library
Drawer DD, Capitol Sta., Austin 78711

270. Winkler, Lorraine
Assistant Librarian
Meyer Branch, Houston Public Library
Houston (5005 W. Bellfort)

271. Wisdom, L. R.
Interlibrary Loan Librarian
Fort Worth Public Library
Fort Worth (6701 Calmont #207, 76116)

272. Wong, Virginia
Adult Librarian
Houston Public Library
500 McKinney, Houston

273. Woodyard, Nancy (Mrs.)
Coordinator of YP & Children's Serv.
El Paso Public Library
501 N. Oregon, El Paso 79901

274. Wright, Jerry
2526 N. Britain Rd.
Irving 75060

275. Yoder, Saida (Mrs.)
Librarian
Weatherford Public Library
318 S. Main, Weatherford

Young, Heartsill 276.
Associate Librarian
University of Texas at Austin
Austin 78712

Zingler, Gilberta M. (Mrs.) 277.
Head, Acquisitions Dept.
Rice University Library
Houston (5701 Jackson #609, 77004)

ADDITIONAL NAMES MENTIONED IN TLA RRT PRE-CONFERENCE INSTITUTE FOR WHICH NO REGISTRATION SLIPS ARE IN EVIDENCE

278. Benton, Lynn
Deer Park Public Library
Deer Park

279. Boyvey, Mary (Mickey) (Mrs.)
Library Coordinator
Texas Education Agency
201 East 11th Street
Austin 78711

280. Fahlberg, Willson J. (Dr.)
Council of Health-Science Libraries
Baylor Univ. College of Medicine
Texas Medical Center, Houston 77025

281. Hall, Beth (Mrs.)
Librarian
Haltom City Public Library
Fort Worth (?)

282. Hansen, Ann
Brazosport Junior College
Freeport

283. Hendricks, Donald (Dr.)
Director, Sam Houston State College Library
Huntsville

284. Holley, Edward C. (Dr.)
Director of Libraries
University of Houston
Cullen Boulevard, Houston 77004

285. Jones, Wyman
Director
Fort Worth Public Library
Fort Worth

Morris, Margaret F(rancine) (Miss) 286.
Reference Librarian
University of Texas at Arlington
Arlington

Nance, Richard (Dr.) 287.
Institute of Technology
Southern Methodist University
Dallas 75222

Schader, Freddy (Miss) 288.
Arkansas Library Commission
506-1/2 Center Street
Little Rock, Arkansas 72201

Sinclaire, Dorothy 289.
Director of S.E.T.I.N.A.
University of Houston
Houston 77004

Ward, Forrest 290.
Coordinating Board of Texas College & University System
201 East 14th Street
Austin 78701

Wolford, Janet (Miss) 291.
Reference Librarian
Mobil Research & Development Corp., FRL
Box 900, Dallas 75221

Yoes, Richard 292.
T.E.M.P.
Communications Laboratory, Univ. of Texas
Austin

APPENDIX C.2
ROOM ARRANGEMENT AND NODE DESIGNATIONS

March 6, 1969

Jefferson D. Caskey, Chairman
Meeting Rooms Committee
T. L. A. Conference
c/o Houston Baptist College
7502 Fondren Road
Houston, Texas 77036

Dear Jeff:

Thank you for your letter of February 24. One equipment operator will be adequate.

Enclosed please find a copy of the desired furniture layout, with accompanying directions/suggestions for Room 114 and the copy for the signs.

If you have any questions please do not hesitate to write or call.

Sincerely,

RLW

Richard L. Waters, Chairman
Institute Planning Committee
Reference Round Table
Texas Library Association

RLW:in

Enclosure

cc: Maxine Johnston
Ruby Weaver
Maryann Duggan ✓

FURNITURE LAYOUT DIRECTIONS/SUGGESTIONS

ROOM 114

Head Table:

Seating for six (6).
Blackboard, with chalk and erasers, on platform.
Podium to sit on table.
If podium does not have mike, be sure one of the table mikes can be used by person at podium. There must be two (2) mikes at table as shown on drawing.
Table must be covered with cloth which will also serve as modesty panel.
Two (2) water pitchers plus paper cups (12) on table.
Four (4) ashtrays on table.

Round (60" diameter) tables:

Please note we want 24 tables instead of 19.
Twelve (12) chairs per table – even if it is crowded.
Tables must be covered with tablecloths. Rent cloths if necessary. (Perhaps Ruby Weaver can handle this if you wish.)
Four (4) ashtrays per table.
Two (2) water pitchers plus paper cups (24) per table.
Twenty-four (24) (instead of 20) 4½' sign holders, one per table, to be placed in center of each table.
Table numbers and sign labels correspond.

Projector table:

Seating for three (3).
One (1) water pitcher and six (6) paper cups.
Two (2) ashtrays.
Table to be clothed.

Coffee service:

If coffee is to be brought in via push carts, no problem.
If urns to set on tables, provide needed number of folding tables with cloths.
Question: Who will serve coffee?

Additional seating:

As shown on drawing. However, if additional seating can be provided without

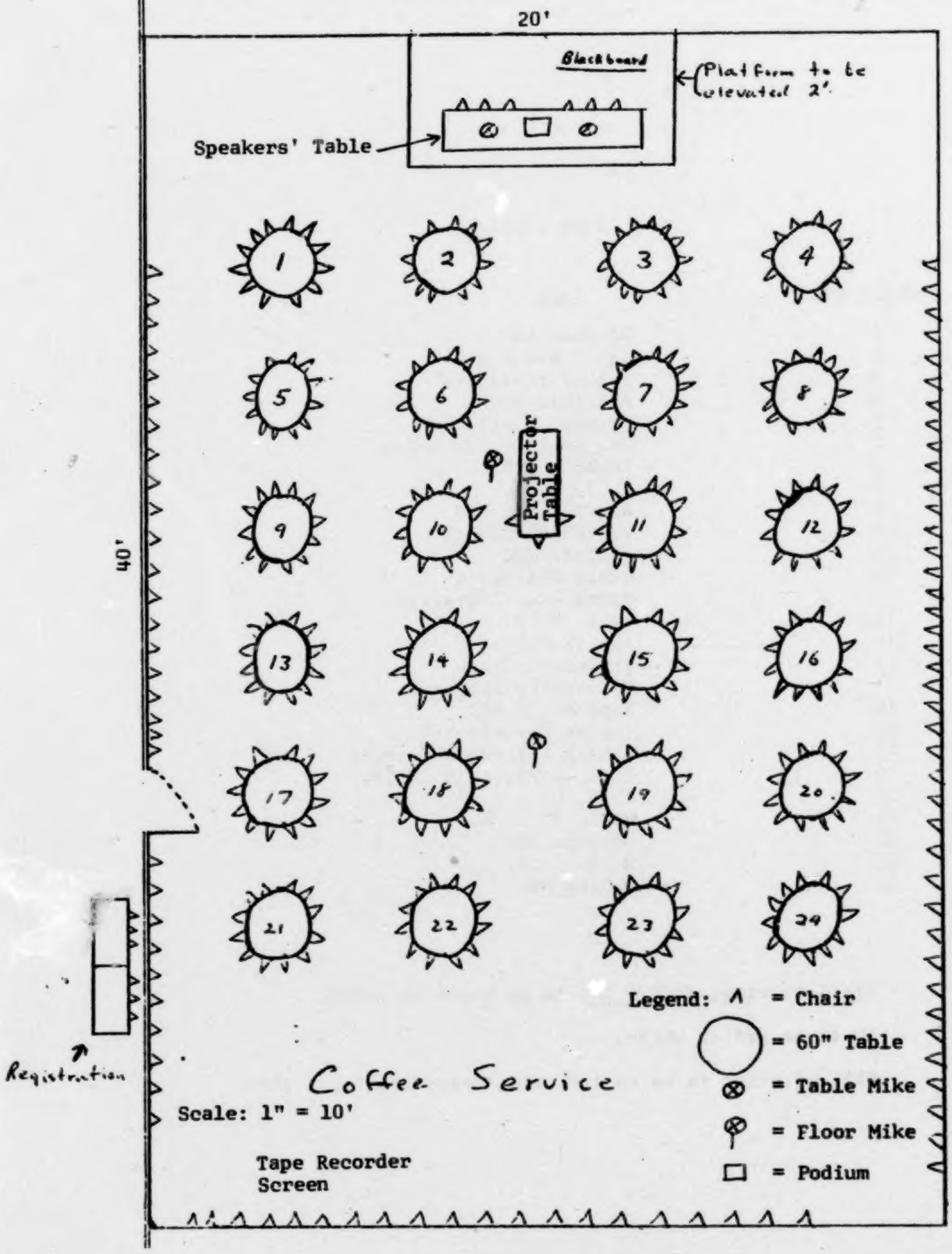
EXTENDING BEYOND FIRST ROW OF TABLES PLEASE ADD.

REGISTRATION TABLE:

SEATING FOR SIX (6).
TWO (2) ASHTRAYS.
TABLES TO BE CLOTHED.

RLW
3-6-69

Room 114 layout for RRT Pre-conference.


20'
Blackboard
Platform to be elevated 2'.
Speakers' Table
1
2
3
4
5
6
7
8
Projector Table
9
10
11
12
40'
13
14
15
16
17
18
19
20
21
22
23
24
Registration
Legend:
Λ = Chair
= 60" Table
⊗ = Table Mike
= Floor Mike
□ = Podium
Coffee Service
Scale: 1" = 10'
Tape Recorder
Screen

SIGN LABELS*

Table No.	Copy
1	El Paso MRC
2	Law Libraries
3	School Libraries
4	Amarillo MRC
5	Special Libraries
6	Jr. College Libraries
7	Lubbock MRC
8	W. I. N.
9	San Antonio MRC
10	SWITCHING CENTER
11	Abilene MRC
12	State College & University Libraries
13	T. E. M. P.
14	Austin MRC
15	Private College & University Libraries
16	Fort Worth MRC
17	Corpus Christi MRC
18	Health Science Libraries
19	I. I. S./T. A. G. E. R.
20	I. U. C.
21	S. E. T. E. N. A.
22	Houston MRC
23	R. I. C. E.
24	Dallas MRC

* All lettering, EXCEPT 10, to be black on white.

10 to be red on white.

All lettering to be as indicated regarding caps, etc.

APPENDIX C.3

PACKET OF HANDOUTS AT REFERENCE ROUND TABLE BEHAVIORAL MODEL

March 26, 1969

Page

(a) Cover Letter C-22
(b) List of Handouts C-23
(c) Final Program and List of Objectives C-24
(d) Preliminary Report on Survey of Cooperative Ventures. C-26
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(f) Directory of Nodes C-29
(g) Real-Live Cases of Interlibrary Situations C-30
(h) L.S.C.A. Title III Text Excerpts C-33
(i) Higher Education Act, Title VIII Text Excerpts . . C-35
(j) Worksheet for Networking Your Own Library. C-37
(k) A Networking Problem C-39
(l) National Interlibrary Loan Code, 1968 . . . . . . C-41
(m) Critique Sheet C-43
(n) Evaluation Sheet C-44
(o) Glossary of Terms Related to Library Cooperation and Interlibrary Networks. C-45
(p) Preliminary Partial Bibliography on Interlibrary Networks, Modeling and Simulation and Other Problem-Solving Methods. C-54
(q) Reprint of President's National Advisory Commission Libraries Report (title page only reproduced here; entire reprint distributed) C-60

TO: TLA REFERENCE ROUND TABLE PARTICIPANTS

Welcome to an exciting professional experience!! Big things are planned for the RRT Institute on March 26. You must be prepared if you are to "Play the Game of Networking."

The enclosed packet will prepare you to be a real, live, active NODE!! Those who have planned the RRT this year need your "feedback" in designing better networks. Please come fully informed!

Bring the enclosed packet with you on March 26 — YOU WILL NEED IT!! See you then . . .

COOPERATIVE INTER-LIBRARY REFERENCE AND INFORMATION NETWORKS
A PRE-CONFERENCE INSTITUTE
Co-Sponsored By
TLA REFERENCE ROUND TABLE
And
THE TEXAS STATE LIBRARY

* * *

MATERIAL FOR DISTRIBUTION TO REGISTRANTS

* 1. Final Program

* 2. Preprint of President's Commission on Libraries Report

* 3. Bibliography on Inter-Library Networks, Modeling, etc.

* 4. Glossary on Inter-Library Networking (and Worksheet for additions to Glossary

* 5. Summary of First Meeting of RRT Statewide Network Committee, February 18, Dallas

6. Worksheets for Networking Own Library

7. List of Questions and Worksheets for Additional Questions

8. Draft Copy of Proposed Inter-Library Loan Code

* 9. Draft Copy of Proposed "Ideal Inter-Library Network"

10. Copies of Pertinent Parts of following "Laws":

    a. LSCA, Title III

    b. HEA, Title IX

    c. Western Information Network

    d. Library Systems Act

11. Proceedings of 1968 RRT Institute on Cooperative Reference Services (For $1.50)

* Enclosed/Mailed to Pre-Registrants

PROGRAM C-24

COOPERATIVE INTER-LIBRARY REFERENCE AND INFORMATION NETWORKS

A PRE-CONFERENCE INSTITUTE
Co-Sponsored By
TLA REFERENCE ROUND TABLE
And
THE TEXAS STATE LIBRARY

Albert Thomas Convention Center, Room 114 — Downtown Houston, Texas
March 26, 1969

8:30 a.m. - Registration, Assignments to Nodes and Pick-Up of Networking Packets

9:00 a.m. - Opening Remarks and Objectives of the Institute
Maxine Johnston, Chairman, Reference Round Table

9:10 a.m. - Recent Developments on the National Scene
Richard Perrine, Pres., ALA Reference Services Div.

Ed Holley, Librarian on Office of Education Knowledge Networks Task Force

9:30 a.m. - Texas Library Networks and Cooperative Reference Services Survey Results
Richard Waters, Chairman, RRT Institute Planning Committee

10:15 a.m. - Questions and Discussion
10:30 a.m. - Coffee
10:45 a.m. - First Report from Official Listeners

11:00 a.m. - Preliminary report of Six Months Evaluation Study of Texas State Library Communication Network
Marie Shultz, Director, Field Services Div., TSL

11:30 a.m. - Reference Librarians and Networks: Houston Case Study of LSCA Title III Special Project
Richard O'Keefe, Project Director

11:50 a.m. - Questions and Discussion
12:00 noon - Lunch
1:00 p.m. - Second Report from Official Listeners

1:15 p.m. - Reference Librarians and Networks: Dallas Pilot Model LSCA Title III Special Project
Maryann Duggan, Project Director

1:35 p.m. - "Games Librarians Play" — or, A Day in the Life of an Inter-Library Loan Librarian
Francine Morris, University of Texas at Arlington

1:50 p.m. - Conceptual Design of an Ideal Library Network for Texas — Preliminary Report of RRT Statewide Network Study Group

2:20 p.m. - Model Library Networks and Library Network Modeling
Richard Nance, SMU Institute of Technology

3:00 p.m. - Questions and Discussion
3:15 p.m. - Coffee
3:30 p.m. - Third Report from Official Listeners

3:45 p.m. - Networking Your Own Library — Discussion and Critique from Attendees and Participants

4:15 p.m. - The Future — Where Do We Go From Here? Final Report from Official Listeners, and Discussion

4:45 p.m. - Reference Round Table Plans for the Future

OBJECTIVES OF THE INSTITUTE

1. To summarize development (national, state, and local) in cooperative reference and information services since the 1968 TLA Reference Round Table Institute.
2. To explore new thinking and approaches to the examination and use of cooperative reference services and library networks.
3. To apply network concepts to local library situations.
4. To develop an ideal statewide, inter-library reference network through participation of institute attendees and Official Listeners.
5. To identify future developments needed in cooperative reference and inter-library networks in Texas.

"OFFICIAL LISTENERS"

The following have been invited to serve as Official Listeners for this Institute. Their mission is to listen for key problems, concepts, trends — and to periodically report their findings or raise questions, thereby helping to direct the Institute toward clear thinking and realistic solutions.

Mrs. Mary Boyvey
Mrs. Lillian Bradshaw
Dr. Wilson Fahlberg
Mrs. Catherine Franklin
Dr. Don Hendricks
Mr. John Hudson
Mr. Paul Janaske
Miss S. Janice Kee
Mr. James L. Love
Mr. Stanley McElderry
Mrs. Frances Neal
Mrs. Dorothy Sinclair
Mrs. Wanda Sivells
Mr. James Stephens
Mr. Forest Ward
Dr. Paul Wasserman
Mr. Robert Whipple
Mrs. Flora Wilhite
Dr. Dorman Winfrey
Miss Jan Wolford
Mr. Heartsill Young
Mr. Richard Yoe
Mr. Wyman Jones

* * *

A SURVEY OF COOPERATIVE VENTURES* SERVING TEXAS LIBRARIES

Preliminary Report
By
Richard L. Waters

Richard Perrine, in his "Survey of Reference Services in Texas Libraries" (Appendix C, 1968) listed 54 "union lists, regional catalogs and cooperative ventures" which were reported by Texas Libraries. Those 54 lists, catalogs and ventures served as the base for this survey. As was the case last year, a coordinator for each MRC district was appointed and made responsible for collecting data from specific ventures as listed by Perrine plus others they were aware of.

Thirty-nine ventures have been surveyed to date. (Some of those reported in 1968 were found to be listed more than once but by a different name; i.e., CORAL and the Bexar County List correctly belong to the Council of Research and Academic Libraries, San Antonio, Texas. Some others apparently have ceased to exist; i.e., the "Dallas List" and a "Union List of Serials in Dallas/Fort Worth Area.") The 39 have been divided into two broad categories: Networks and Union Catalogs. For the purpose of this survey a Network has been defined as: An interconnection of things (other than the printed word), systems or organizations. A Union Catalog has been defined as: Any compilation of printed material related by subject or format in which two or more libraries share responsibility for publishing and/or maintaining.

The "Networks" and "Cooperative Ventures" have been further divided geographically. The divisions are:

Local - Encompassing not more than three MRC Districts.
State - Encompassing three to ten MRC Districts.
Regional - Encompassing all or a portion of Texas plus extending into at least one other state. (A further division was made with regard to "Networks" by distinguishing between those headquartered in Texas and those whose headquarters are in another state.)

No attempt was made to survey national networks (i.e., EDUCOM, MEDLARS), nor all but a few national union catalogs.

Following are the names and headquarters location (if known) of the 39 ventures, by category.

LOCAL NETWORKS

Centralized Processing Center - Fort Worth Public Library
Council of Research and Academic Libraries (CORAL) - San Antonio
Inter-University Council Private Line Teletype Network (I.U.C.) - University of Texas at Arlington
Midland-Odessa Union Exchange List of Serials - Midland & Odessa
Odessa-Midland Public Libraries Reciprocal Borrower's Agreement - Odessa & Midland
West Texas Film Circuit, Inc. - Abilene Public Library
Western Information Network Association (W.I.N.) - Lubbock

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* Any activity involving two or more libraries and/or other agents.

STATE NETWORKS

Council of State College Librarians (Texas Information Exchange) - No permanent headquarters
Texas State Library Network - Austin

REGIONAL NETWORKS (HEADQUARTERED IN TEXAS)

Industrial Information Services (I.I.S.) - Southern Methodist University
Regional Information and Communication Exchange (R.I.C.E.) - Rice University
Texas Medlars Search Station - Texas Medical Center, Houston
Texas Technical Application Network (Tex-Tan) - Austin

REGIONAL NETWORKS (HEADQUARTERED OUTSIDE TEXAS)

Bibliographical Center for Research, Rocky Mountain Region - Denver, Colo.
Medical Library Association, Southern Regional Group - No permanent headqtrs.
Southwestern Academic Library Consortium - No permanent headquarters.
Southwestern Union List of Serials - Albuquerque, New Mexico
Technology Application Center (TAC) - University of New Mexico, Albuquerque

LOCAL UNION CATALOGS

Data Processing Bibliography - Dallas Public Library
Newspaper Resources of District IV: A Union List - University of Houston
Union List of Periodicals for the top 26 Counties of Texas - Amarillo Public Library
Union List of Periodicals, Houston MRC - Houston Public Library
Union List of Winchell Titles - Rice University

STATE UNION CATALOGS

Catalog of Genealogical Materials in Texas Libraries - Texas State Library, Austin
Catalogue of Research Facilities in Texas - Texas A & M University
The Texas List - Houston (Phil Wilson, Publisher)
Union Catalogue of Texana - Barker Library, University of Texas at Austin
Union List of Serials of Texas Health Science Libraries - University of Texas Medical Branch Library, Galveston

REGIONAL (NATIONAL) UNION CATALOGS

American Medical Speciality Board Bibliography Project - University of Arkansas Medical Center, Little Rock
Comprehensive List of Periodicals for Chemistry and Chemical Engineering (ACCESS) - Chem Abstracts Service, Columbus, Ohio
Geologic Field Trip Guidebooks of North America: A Union List Incorporating Monographic Titles - American Geological Institute, Washington, D. C.
New Serial Titles - Library of Congress, Washington, D. C.
Newspapers on Microfilm - Library of Congress, Washington, D. C.
Union Catalog of Presbyteriana - Presbyterian Historical Society, Philadelphia, Pennsylvania
Union List of Biomedical Serial Holdings in the South Central Region - University of Texas Medical Branch Library - Galveston
Union List of Serials - Library of Congress, Washington, D. C.
Union List of Serials for Public Utility Libraries - New York, New York

This preliminary report makes no attempt to relate other data about the above, except to state that most ventures, especially those based in Texas, are in their infancy and thus the information collected is often incomplete.

March 10, 1969

PROPOSED BASIC ELEMENTS OF "IDEAL" STATEWIDE INTER-LIBRARY NETWORK

By Maryann Duggan

The following are offered for review and critique by the Reference Round Table. What should an "ideal" statewide network look like in Texas? What do YOU think? What do YOU propose?

As a minimum, it is suggested that such a network must have the following components or characteristics:

1. Organizational Structure - providing for fiscal, legal, planning, policy formulation and requiring commitment, operational agreement and common purpose.
2. Collaborative Development of Resources, providing for cooperative acquisition of rare and research material and for strengthening local resources for recurrently used material. Multi-media resources developing essential.
3. Identification of Nodes, providing for designation of role specialization as well as for geographic configuration.
4. Identification of Primary Patron Groups, providing for assignment of responsibility for library service for all citizens within the network.
5. Identification of Levels of Service, providing for basic needs of patron groups as well as special needs and identifying distribution of each service type among the nodes; must provide for "referral" as well as "relay"; for document transfer as well as "information transfer."
6. Legal Right of Access, providing fiscal, contractual, legal planning and policies.
7. Establishment of Bi-Directional Communication System, providing "conversational mode" format and designed to carry desired message/document load at each level of operation.
8. Common Standard Message Codes, providing for understanding among the nodes on the network.
9. Central Bibliographic Record, providing for location of needed items within the network.
10. Switching Capability, providing for interfacing with other networks as well as determining the optimum communication path within the network.
11. Selective Criteria of Network Function, providing guidelines of what is to be placed on the network.
12. Evaluation Criteria and Procedures, providing feedback from users and operators and means for network evaluation and modification to meet specified operational utility.
13. Training Programs, providing instruction to users and "operators" including policy and procedures.

IN SUMMARY, the so-called ideal statewide inter-library network should be so designed that any citizen anywhere in the state can have access to the total library and information resources of the state through his own local library.

BE PREPARED TO PRESENT YOUR IDEAS
ON AN IDEAL STATEWIDE INTER-LIBRARY NETWORK FOR TEXAS!!

DIRECTORY OF NODES
TLA REFERENCE ROUND TABLE PRE-CONFERENCE
INTER-LIBRARY NETWORK GAME

* * *

NODE NO.	NODE COMPOSITION
1	El Paso MRC
2	Law Libraries
3	School Libraries
4	Amarillo MRC
5	Special Libraries
6	Junior College Libraries
7	Lubbock MRC
8	W.I.N.
9	San Antonio MRC
10	SWITCHING CENTER
11	Abilene MRC
12	State College & University Library
13	T.E.M.P.
14	Austin MRC
15	Private College & University Library
16	Fort Worth MRC
17	Corpus Christi MRC
18	Health Science Libraries
19	IIS/TAGER
20	I.U.C.
21	S.E.T.E.N.A.
22	Houston MRC
23	R.I.C.E.
24	Dallas MRC

* * *

REAL LIVE CASES
OF INTER-LIBRARY "SITUATIONS"

WHAT WOULD YOU DO IF YOU WERE THE LIBRARIAN?
WHAT POLICY WOULD YOU FOLLOW? WHAT PROCEDURE?

Node 15 1. A small private university needs a copy of a technical report for a professor who is submitting a research contract proposal. (You are that university librarian.)

Node 4 2. A large public library has been asked for a copy of Chaucer's tales by a smaller public library in its MRC. (You are the librarian of the large public library.)

Node 17 3. A small public library is requested by a local businessman to compile a bibliography on fuel cells, particularly articles with pictures.

Node 3 4. The state university library in a medium-size town has been asked by a junior high school student to check out a book on nuclear reactions.

Node 8 5. A teacher in a high school in a large city has asked the local building librarian for transparencies illustrating the circulation system of a frog.

Node 9 6. A blind lady in a small town has asked the local public library for books in braille or for large print books.

Node 1 7. The local judge in a medium size town needs a copy of the statutes of another state.

Node 16 8. A local businessman needs recent census tract data on population statistics in another, larger city in the state.

Node 14 9. A small public library is asked by a high school student to get copies of articles on dope addition from some medical journals.

Node 5 10. A research scientist in a local industrial research laboratory has asked the local public library for information on availability of Russian translations of a specific article.

Node 12 11. The fire chief of a medium size town has asked the state university library in the town to find copies of laws pertaining to labor unions for municipal employees.

Node 3 12. A teacher in a local elementary school asked the building librarian to get a copy of an article from an education journal on new teaching methods. The teacher is taking a credit course in education from a nearby state university.

Node 7 13. A local club woman has asked the medium size local public library for a book of Greek plays.

Node 15 14. A local club woman has asked the local private university library for a book of Greek plays.

Node 16 15. A high school student has asked the local private university library for a book of Greek plays.

Node 5 16. A high school student has asked the librarian in an industrial research library to use the library and to borrow a textbook on chemistry.

Node 17 17. A doctor in a small town has asked the local public library for a copy of an article from a medical journal.

Node 6 18. A junior college student in a large city has asked the branch public library for a book on accounting practices which is used by the local university as a text book.

Node 18 19. A practicing physician in a large city has asked the medical school library to compile a bibliography on the side effects of birth control pills.

Node 20 20. The regional planner for the local COG has asked the local state university library to locate recent laws on air pollution in urban areas.

Node 10 21. The state library has been asked by a Major Research Center for a medical book for one of the smaller libraries in the region.

Node 1 22. The local public library in a small town is asked by the president of a service club for a movie on safe driving.

Node 23 23. The professor at a large private university needs a copy of a geologic map of a distant state.

Node 2 24. The school board members in a small town ask the school librarian for a copy of the senate hearings on education for disadvantaged.

Node 22 25. A large public library gets an inter-library loan request from a small public library and out of the state for a fairly common book on city management.

Node 24 26. A professor from the local university asks the local branch library in a large city for a government document on lawn care.

Node 14 27. The Chamber of Commerce president in a medium size town asks the local university library for a listing of all the economic development agencies in other states.

Node 19 28. The college student in an out of town state university asked the local private university to borrow a book needed in his course work.

Node 20 29. A small private university gets an inter-library loan request for a fairly common, in-print book from an out-of-town business library.

Node 22 30. A large public library has been asked by a local businessman to borrow a copy of an out-of-print American imprint on history of banking in Europe.

Node 21 31. A local school principal in a small town asks the local public library for a film to use during the next PTA meeting.

Node 11 32. A local businessman in a medium size town (which also has a state university and is nearby to an industrial research complex) asks the local public library for a copy of an old U.S. patent.

Node 13 33. A local high school student asks the local public library to borrow for him a book of British short stories required for reading in the freshman English class at the local university.

Node 2 34. The local farmer in a small town has asked the County library branch to get him a copy of a government report on soil conservation.

Node 6 35. The local housewife has asked the local junior college to use the French I language tapes to prepare for a trip to Europe.

Node 13 36. The local lawyer in a small town has asked the State Library to compile a list of laws on accidental poisoning by error in filling a prescription.

Node 4 37. The local veterinarian in a small town has asked the local public library for material on surgical procedures for heart transplants in animals.

Node 9 38. The owner of a private nursing home in a large city has asked for a book mobile stop once a month.

Node 7 39. The teacher in a private elementary school has asked the nearby public elementary school library for a copy of a film strip on civics unit.

Node 8 40. An employee of a business firm in the suburbs of a large city is taking a college course over closed circuit TV from a distant state university. He needs a book. Where should he go?

Node 23 41. The local waterworks chemist of a medium size city has asked the local private university for a book on treatment of municipal water supplies.

Node 18 42. The medical school librarian in a large city has received a request from a local building librarian in the public school for transparencies on the circulatory system of a frog.

* * *

LIBRARY SERVICES AND CONSTRUCTION ACT
AS AMENDED IN 1966
PUBLIC LAW 89-511

TITLE III — INTER-LIBRARY COOPERATION
AUTHORIZATION OF APPROPRIATIONS

Sec. 301. There are authorized to be appropriated for the fiscal year ending June 30, 1967, the sum of $5,000,000; for the fiscal year ending June 30, 1968, $7,500,000; for the fiscal year ending June 30, 1969, $10,000,000; for the fiscal year ending June 30, 1970, $12,500,000; and for the fiscal year ending June 30, 1971, $15,000,000; which shall be used for making payments to States which have submitted and had approved by the Commissioner State plans for establishing and maintaining local, regional, State or interstate cooperative networks of libraries.

ALLOTMENTS

Sec. 302. From the sums appropriated pursuant to section 301 for each fiscal year the Commissioner shall allot $10,000 each to Guam, American Samoa, the Trust Territory of the Pacific Islands, and the Virgin Islands, and $40,000 to each of the other States, and shall allot to each State such part of the remainder of such sums as the population of the State bears to the population of the United States according to the most recent decennial census.

PAYMENTS TO STATES

Sec. 303. From the allotments available therefor under section 302, the Secretary of the Treasury shall from time to time pay to each State which has a plan approved under section 304 an amount equal to the Federal share which for the fiscal year ending June 30, 1968, shall be 100 per centum of the total sums expended under such plan (including costs of administering such plan), and for any fiscal year thereafter shall be 50 per centum of such sums, except that the Federal share for the Trust Territory of the Pacific Islands shall be 100 per centum.

STATE PLANS FOR INTERLIBRARY COOPERATION

Sec. 304. (a) To be approved for purposes of this title a State plan must —

(1) meet the requirements of paragraphs (1), (2), (4), and (5) of section 103(a).

(2) provide policies and objectives for the systematic and effective coordination of the resources of school, public, academic, and special libraries and special information centers for improved services of a supplementary nature to the special clientele served by each type of library or center;

(3) provide appropriate allocation by participating agencies of the total costs of the system;

(4) provide assurance that every local or other public agency in the State is accorded an opportunity to participate in the system;

(5) provide criteria which the State agency shall use in evaluating applications for funds under this title and in assigning priority to project proposals; and

(6) establish a statewide council which is broadly representative of professional library interests and of library users which shall act in an advisory capacity to the State agency.

(b) The Commissioner shall approve any State plan which meets the conditions specified in subsection (a) of this section.

* * *

FROM: HIGHER EDUCATION AMENDMENTS OF 1968

October 16, 1968

Pub. Law 90-575
90th Congress
S.3769

PART F — NETWORKS FOR KNOWLEDGE

Sharing of Educational and Related Resources Among Colleges and Universities

Sec. 251. The Higher Education Act of 1965 is amended by redesignating title VIII as title XII, and sections 801 through 804 (and references thereto however styled in such Act, or any other Act, including such references heretofore made in this Act) as sections 1201 through 1204, respectively. The Higher Education Act of 1965 is further amended by inserting after title VII the following new title:

"TITLE VIII — NETWORKS FOR KNOWLEDGE

"Sharing Educational and Related Resources

"Sec. 801. (a) To encourage colleges and universities to share to an optimal extent, through cooperative arrangements, their technical and other educational and administrative facilities and resources, and in order to test and demonstrate the effectiveness and efficiency of a variety of such arrangements the Commissioner is authorized to enter into contracts and to make project grants for all or part of the cost of planning, developing, or carrying out such arrangements. Such grants may be made to public or nonprofit private colleges or universities. When in the Commissioner's judgment it will more effectively promote the purposes of this title, the Commissioner may make grants to other established public or nonprofit private agencies or organizations, including professional organizations or academic societies and he may enter into contracts with established private agencies and organizations.

"(b) Projects for the planning, development, or carrying out of such arrangements assisted under this title may, subject to the provisions of subsection (c), include —

"(1)(A) joint use of facilities such as classrooms, libraries, or laboratories, including joint use of necessary books, materials, and equipment; or (B) affording access to specialized library collections through preparation of interinstitutional catalogs and through development of systems and preparation of suitable media for electronic or other rapid transmission of materials;

"(2) establishment and joint operation of closed-circuit television or equivalent transmission facilities (such as the instructional television fixed services); and

"(3) establishment and joint operation of electronic computer networks and programs therefor, to be available to participating institutions for such purposes as financial and student records, student course work, or transmission of library materials.

"(c)(1) Grants pursuant to clause (B) of paragraph (1) of subsection (b) may not be used to pay the costs of electronic transmission terminals.

"(2) In the case of a project for the establishment and operation of a computer network, grants may not include —

"(A) the cost of operating administrative terminals or student terminals at participating institutions; or

"(B) the cost, or any participating institution's pro rata share of the cost, of using the central computer facilities of the network, except (i) such costs of systems development and programming of computers and transmission costs as are necessary to make the network operational, (ii) the administrative and program support costs of the central facilities of the network, and (iii) the line-access costs incurred by participating institutions.

"Appropriations Authorized

"Sec. 802. There are authorized to be appropriated for the purposes of this title (and planning and related activities in the initial fiscal year for such purpose), $340,000 for the fiscal year ending June 30, 1969, $4,000,000 for the fiscal year ending June 30, 1970, and $15,000,000 for the fiscal year ending June 30, 1971.

"Authority for Free or Reduced Rate Communications Interconnection Services

"Sec. 803. Nothing in the Communications Act of 1934, as amended, or in any other provision of law shall be construed to prevent United States communications common carriers from rendering, subject to such rules and regulations as the Federal Communications Commission may prescribe, free or reduced rate communications interconnection services for interconnection systems within the purview of this title, whether or not included in a project for which a grant is made under this title."

* * *

WORKSHEET FOR NETWORKING YOUR OWN LIBRARY

OR

"TWENTY QUESTIONS ON NETWORKING"

The time has now come for decisions and action!!!!

Assuming the "nodes" in this room represent real types of libraries and locations of libraries, let us see what your node would decide on the following:

1. Does your "node" want to join a "network"?
2. Which network do you wish to join? Why? (Homogeneous or Hetrogeneous? Vertical or Horizontal?)
3. What type of node/network relationship do you wish?
4. What type of services or resources do you expect to get from the network? What selectivity criteria?
5. What type of services or resources does your node expect to offer the network? What selectivity criteria?
6. What B/L Radio do you anticipate for your node? What total B + L?
7. What type of network organization do you prefer? Directed or Undirected?
8. By what legal authority can you join a network? What type of formal agreement do you visualize? Who must approve contractual agreements?
9. Who will pay for the network operation? On what basis are allocation of costs among the network members determined?
10. What "communication channel" do you plan to use? How much will it cost per month? Per message? What message load do you anticipate? What turn-around time? What channel capacity do you need?
11. What geographic configuration do you wish in the network? Will it mix governmental units?

12. Do you plan to "switch" requests locally? In the MRC area? At the state level? Where and how should your node interface with other networks?

13. Who will work out the operating policies and procedures for the network and the node/network "rules of the game"?

14. How will you train your staff to use the network capability?

15. How will you evaluate the network performance? What criteria are important to your node? To the total network?

16. What patron group will you serve (a) as a requesting node and (b) as a receiving node? Are you going to emphasize Patrol Mobility or Material Mobility?

17. What role specialization do you visualize for (a) your node and (b) other nodes in the network and (c) the switching center (if there is one)?

18. How will network participation influence your own library policies and procedures on (a) book selection, (b) acquisition, (c) cataloging, (d) retention of material, (e) automation of technical processes and/or circulation systems?

19. Do you visualize any node/network conflict in goals? If such were to occur, how would you resolve the conflict — (a) leave the network, (b) try to modify the network goals, (c) modify your node's goals?

20. What other factors do you think are important?

A NETWORK PROBLEM

In the event that you have friends who believe library problems to be simple, or in case you have some time to spend solving problems, the following is offered to you. The solution will be provided during the discussion of library networks.

Problem:

Libraries A, B, C and D participate in a network. Currently each library transfers messages to the others by telephone. On an average daily basis each library has determined its messages initiated and received to be:

Library	Initiations	Receipts
A	50	55
B	100	45
C	35	95
D	65	55

Now the number of messages which can be sent by telephone from one library to another in a day is limited (obviously, by the staff size — only so many people available to answer telephones). Transfer of telephone messages between libraries also "costs" the communicating libraries. (These "costs" may be in terms of dollars or something else.) The limitations on messages which may be sent, and the cost per message for sending it are shown in the table below. In addition, the number of messages to be initiated and received by each library is shown.

INITIATIONS	ORIGINATING LIBRARY	RECEIVING LIBRARY (Upper cell value is cost; lower value () is the limit on messages.)			
		A	B	C	D
50	A	X	12 (25)	8 (36)	10 (20)
100	B	20 (40)	X	12 (65)	9 (35)
35	C	14 (15)	9 (30)	X	15 (25)
65	D	12 (20)	11 (30)	10 (35)	X
Receipts →		55	45	95	55

Since Library A never sends messages to itself (nor does B, C, or D) the diagonal cells are crossed out. In each of the other cells is given the cost per message and the limit on the number of messages; for example, the cost per message for sending a message from A to B is 12, and a maximum of 25 messages may be sent from A to B during the day.

The problem is to send all the messages initiated during the day by each of the libraries to the others in a manner so that

1. All messages initiated are sent,
2. No more messages are received at any library than the library has agreed to receive (55 for A),
3. No more messages are sent from any library to another than the limit set for the two (25 for A → B), and
4. The total "cost" solution for all the messages sent and received is the minimum possible value.

This problem is not easily solved —that is the point. The minimum cost requirement (4) is the hooker, but you can easily try out some solutions on your own. For example, the solution

	COST	
(A,B) = 20 →	20 x 12 =	240
(A,C) = 30	30 x 8 =	240
(B,A) = 40	40 x 20 =	800
(B,C) = 30	30 x 12 =	360
(B,D) = 30	30 x 9 =	270
(C,A) = 10	10 x 14 =	140
(C,D) = 25	25 x 15 =	375
(D,A) = 5	5 x 12 =	60
(D,B) = 25	25 x 11 =	275
(D,C) = 35	35 x 10 =	350
		3,210

meets all the initiation, receipt, and limitation requirements at a cost of 3,210. Can you specify the message transfers, meeting all requirements, which will result in a lower total cost?

Richard Nance

RN:rm

National Interlibrary Loan Code, 1968

INTRODUCTION

This code, adopted by the Reference Services Division, acting for the American Library Association on June 27, 1968, governs the interlibrary lending relations among libraries on the national level, among research libraries, and among libraries not operating under special or local codes. Libraries of a common geographical area or those specializing in the same field may find it advantageous to develop codes for their own needs. There is appended to this national code a model state code[1] which may be considered for adoption by such groups of libraries with common interests.

On the national level interlibrary loan requests should be restricted to materials which cannot be obtained readily and at moderate cost by other means. The costs involved in lending and the conflict in demand for certain kinds of materials necessitate this restriction.

The American Library Association has published[2] a manual explaining in detail the procedures which should be used in implementing the principles of this code. Libraries requesting materials on interlibrary loan are expected to have copies of this manual and to abide by its recommendations.

The present interlibrary loan system may be radically changed by less conventional methods of transmission of materials, such as telefacsimile and computer networks. Until such methods have gained widespread acceptance, their use must be based on special agreements among libraries.

I. *Definition.* Interlibrary loans are transactions in which library materials are made available by one library to another for the use of an individual; for the purposes of this code they include the provision of copies as substitutes for loans of the original materials.

II. *Purpose.* The purpose of interlibrary loans is to make available, for *research*, materials not owned by a given library, in the belief that the furtherance of knowledge is in the general interest. Interlibrary loan service supplements a library's resources by making available, for the use of an individual, materials from other libraries not owned by the borrowing library.

III. *Responsibility of Borrowing Libraries.*

1. It is assumed that each library will provide the resources to meet the study, instructional, informational, and normal research needs of its users, and that requests for materials from another library will be limited to unusual items which the borrowing library does not own and cannot readily obtain at moderate cost. Requests for individuals with academic affiliations should be limited to those materials needed for faculty and staff research, and the thesis and dissertation research of graduate students.

2. Thesis topics should be selected according to the resources on hand and should not require extensive borrowing from other libraries. If an individual needs to use a large number of items located in another library, he should make arrangements to use them at that library.

3. The borrowing library should screen carefully all applications for loans and should reject those which do not conform to this code.

IV. *Responsibility of Lending Libraries.*

1. In the interests of furthering research it is desirable that lending libraries interpret as generously as possible their own lending policies, with due consideration to the interests of their primary clientele.

2. A lending library has the responsibility of informing any borrowing library of its apparent failure to follow the provisions of this code.

V. *Scope.*

1. Any type of library material needed for the purpose of research may be requested on loan or in photocopy from another library. The lending library has the privilege of deciding in each case whether a particular item should or should not be provided, and whether the original or a copy should be sent.

2. Libraries should not ordinarily ask, however, to borrow the following types of materials:

a. U.S. books in print of moderate cost
b. Serials, when the particular item needed can be copied at moderate cost
c. Rare materials, including manuscripts
d. Basic reference materials
e. Genealogical, heraldic, and similar materials
f. Bulky or fragile materials which are difficult and expensive to pack (*e.g.* newspapers)
g. Typescript doctoral dissertations, when fully reproduced in microfilm and readily available

VI. *Expenses.*

1. The borrowing library assumes the responsibility for all costs charged by the lending library, including transportation, insurance, copying, and any service charges. If the charges are more than nominal, and not authorized beforehand by the borrowing library, the lending library should inform the requesting library and ask for authorization to proceed with the transaction. Borrowing libraries should try to anticipate charges, such as for copies,

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[1] Not included with this text. In preparation and to be published in the manual in 1969.

[2] Manual in preparation and not yet published as of September 5, 1968.

C-42

and authorize them on the original request.

2. It is recommended that in the interests of efficiency the lending library absorb costs which are nominal, such as for postage.

VII. *Conditions of Loans.*

1. The safety of borrowed materials is the responsibility of the borrowing library. In case of loss or damage the borrowing library is obligated to meet all costs of repair or replacement, in accordance with the preferences of the lending library.

2. The borrowing library is bound by any limitations on use imposed by the lending library. It is recommended to lending libraries that any limitations (such as "for use in library only") be based on the physical condition or the bibliographic character of the particular item rather than be imposed on all materials lent.

3. Unless specifically forbidden by the lending library, copying by the borrowing library is permitted provided that it is in accordance with copyright law and American Library Association policy.

VIII. *Placement of Requests.*

1. Libraries should exhaust local resources and make an effort to locate copies through the use of bibliographical tools, union lists, and union catalogs. Requests should be made to one of the nearer institutions known to possess the desired material. Care should be taken, however, to avoid concentrating requests on a few libraries.

2. In the absence of special agreements, requests should normally be placed by mail using the standard ALA forms, or by teletype using a format based on the ALA interlibrary loan form. When an urgent request is made by telephone, this initial request should be immediately followed by the confirming ALA form.

IX. *Form of Request.*

1. Materials requested must be described completely and accurately following accepted bibliographic practice.

2. Items requested should be verified and sources of verification given, and for this purpose borrowing libraries should have access to basic bibliographic tools. When the item requested cannot be verified, the statement "Cannot verify" should be included with complete information on the original source of reference. If this provision is disregarded and the bibliographic data appear to be incorrect, the request may be returned unfilled without special effort to identify the reference.

3. The name and status (position or other identifying information) of the individual for whom the material is being requested should be included on the request form.

4. A standard ALA interlibrary loan form should be used for each item requested (or an ALA photoduplication order form, when it is known that copies will be supplied and payment required).

5. All correspondence and shipments should be conspicuously labeled "Interlibrary Loan."

X. *Duration of Loan.*

1. Unless otherwise specified by the lending library, the duration of loan is normally calculated to mean the period of time the item may remain with the borrowing library, disregarding the time spent in transit.

2. The borrowing library should ask for renewal only in unusual circumstances, and a second renewal should never be asked for without a specific explanation. The renewal request should be sent in time to reach the lending library on or before the date due. The lending library should respond to renewal requests promptly; if it does not, it will be assumed that renewal for the same length as the original loan period is granted.

3. Material on loan is subject to recall at any time and the borrowing library should comply promptly.

4. The loan period specified by the lending library should be appropriate to the type of material.

XI. *Notification and Acknowledgment.*

1. The lending library is expected to notify the requesting library promptly whether or not the material is being sent; if the material cannot be supplied, the lending library should state the reason.

2. Except in the case of very valuable shipments, no acknowledgment of receipt is necessary. If there is undue delay in receipt, however, the receiving library has a responsibility to notify the lending library so that a search may be initiated promptly.

XII. *Violation of Code.*

Continued disregard of any of the provisions of this code is sufficient reason for suspension of borrowing privileges. ■■

GB Gaylord Bros., Inc.
LIBRARY SUPPLIES AND EQUIPMENT
Syracuse, N. Y. 13201 Stockton, Calif. 95201

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CRITIQUE

I think the "Ideal State-Wide Inter-Library Network" should also include:

I do not like the following in the proposed "Ideal Network":

Please complete and turn in
at the Reference Round Table
or mail to:

Maryann Duggan
Industrial Information Services
Science Information Center
Southern Methodist University
Dallas, Texas 75222

(Optional)

Name______________________________

Library______________________________

Mailing Address______________________________

____

RRT INSTITUTE — EVALUATION SHEET

All participants sincerely seek your evaluation of this RRT Institute and your ideas on a topic for next year. You do not have to sign your name!!

INDICATE YOUR OPINION IN EACH SQUARE E = Excellent F = Fair G = Good P = Poor	PRESENTATION STYLE	GRAPHICS OR VISUAL AIDS	QUALITY OF CONTENT	PREPARATION OF SPEAKER	INNOVATION OF IDEAS	APPLICABILITY TO REFERENCE SERVICES
1. Total RRT Institute						
2. Official Listeners' Reports						
3. Networking Games and Cases						
4. Formal Papers:						
a. Perrine & Holley						
b. Waters						
c. Shultz						
d. Duggan						
e. Morris						
f. Nance						
5. Handout Packet Content						
6. Room Arrangement						
7. "Ideal Network" Design						
8. Discussion Periods						

GENERAL REMARKS: (anything you want to say!) ______________________

____

____

What would you like to see done next year? ______________________

____

Your Name (optional) ______________________ Library ______________________

G L O S S A R Y

OF

TERMS RELATED TO LIBRARY COOPERATION

AND

INTER-LIBRARY NETWORKS

March, 1969

Prepared by

Maryann Duggan

Richard Nance

Jim Stephens

and others

* * *

NOTE TO THE READER:

We have tried to include in this glossary the various terms and concepts that may be unique to librarianship or that we are using in a special meaning. Please use the enclosed "Glossary Work Sheet" to help make this Glossary more complete. Mail your work sheet to Maryann Duggan at SMU, or turn it in at the RRT Institute.

* * *

GLOSSARY OF TERMS
RELATED TO LIBRARY COOPERATION AND INTER-LIBRARY NETWORKS

ACCESS - The ability to use a system with or without constraints.

ALGORITHMS -

AREA - The Major Resource Center geographic areas designated by Texas State Library.

BATCH MODE - A request - answer - request sequence of transmitting messages or handling transactions. May be in series or in parallel.

BENEFIT/COST RATIO - The numeric ratio showing the units of benefit derived for each unit of cost.

B/L RATIO - The ratio of borrowing to lending transactions at any one node or within the total network.

B/L RATIO ZONE TECHNIQUE - A possible method of computing node/network relationships as a function of $\frac{B}{B+L} \times B+L$ assigning Activity Zones which determine node/network balance.

BLACK-BOX - Any sub-system with all available input/output terminals to achieve any function at the wish of the designer.

BOMB-OUT - Failure to achieve mission; i.e., not finding requested document.

BOUNDARY - The "layer" between two systems which permits the possibility of energy transfers in either direction. It also is called an "interface." May also be described as that region separating one system from another; serves as a coding and decoding function.

BRADFORD'S LAW OF SCATTERING - The quantitative analysis of "hard core" resources as compared to little-used resources. A methodology applicable to the design of resource distribution in a network.

BREAK-EVEN ANALYSIS - The technique for determining effect on one variable when another linear variable is changed and for determining when each variable is equal.

CAPACITY, CAPACITATED - See CHANNEL CAPACITY.

CAPACITATED SYSTEM - Upper and lower limits of performance pre-determined.

CHANNEL - The device for communicating between nodes. See COMMUNICATION CHANNEL.

CHANNEL CAPACITY - The maximum number of messages which can be transmitted over the designated channel in a given period of time and at a given rate.

CHANNEL/NODE COMBINATION - The particular combination of a communication channel linking two nodes within the library network. The sub-system resulting from the combination of a given channel with a given node.

CHANNEL UTILITY - The benefit or utility derived from using a designated channel for a message transfer from Library A to Library B.

Example: Channel Utility may consist of the cost of communication between the 2 libraries, the probability that the library assessed can supply the desired answer, etc.

CODING:DECODING - Conversion of message language to standard format and symbols.

COMMUNICATION CHANNEL - The means by which messages are transferred to libraries within the network; i.e., courier, telephone, telex.

COMMUNICATIONS TECHNICAL TERMINOLOGY - See Glossary on pp. 404-415 of Edunet.

COMPATIBILITY - The quality which permits the interchange between systems.

CONSTRAINT SET - The set of equations representing the bounds on a particular problem solution.

COOPERATION/COLLABORATION -

COOPERATIVE VENTURES (re Waters) - Any activity involving two or more libraries and/or other agents.

CRITERION FUNCTION - The function representing the objective of the model.

CRITICAL PROXIMITY - Critical distance beyond which components cannot function in a system.

ECISION THEORY - CONDITIONS OF CHOICE - Choices made under conditions of (1) certainty; (2) risk, or (3) uncertainty.

Certainty assumes a given state.
Risk recognizes various states and predicts relative ratios.
Uncertainty - ignorance of probability of occurrence of various states.

ECISION VARIABLE - The decision of the amount to transfer from Library A to Library B using communication channel K.

EPENDENCY/INTER-DEPENDENCY - A distribution between a node depending on the network as compared to a node contributing to the network. See also B/L RATIO.

ISCRETE - The smallest unit; a unit which can be distinguished from other units.

OCUMENT - The generic term for a single bibliographic entity. Sometimes called "item."

OCUMENT TRANSFER - The exchange or transfer of a document from one system to another system or from one node to another node.

YNAMIC PROGRAMMING - A procedure for analyzing problems in a stage-by-stage fashion rather than attempting to solve the entire problem at one time.

CCLECTIC - The selective approach using some value system or criteria for solution.

ENTROPY - Energy cost unrecoverable in any system at any level of operation.

EXOGENOUS FACTORS - Factors outside the system that influence the system's performance.

FEEDBACK - The returning of information to the system to permit adjustments in operations. Ideally, should be automatic and invariant, and so regulate the system that it can maintain steady operation even under disturbed conditions.

FUNCTIONAL CONFIGURATION - The distribution of task specialization within a network organization.

GAME THEORY - The mathematical analysis of competitive situations where actions involve conflict.

GATE - Controls the rate of input-output flow.

GENERAL SYSTEMS THEORY (GST) - A cluster of strategies of inquiry; a set of unifying principles transcending the conventional compartments of academia; and a framework of general theory to stimulate interdisciplinary thinking.

GENERAL THEORY OF INTER-LIBRARY NETWORKS - The objective of identifying basic factors that can be applied to any Inter-Library Network.

GEOMETRIC CONFIGURATION - The physical or geographic topography of the network (as compared to the organizational configuration).

GEOGRAPHIC CONFIGURATION - The geographic distribution of the nodes in the network.

GEOGRAPHIC LEVEL - The various geographic proximities from the base point; i.e., city, county, MRC area, State, Region, National, International.

GRAPH THEORY -

GRID - The graphical presentation of data on an X, Y scale in quantitative units. Also used to describe the coverage of a geographic area by a communication system.

GROUP THEORY -

HETEROGENEOUS HORIZONTAL NETWORK - A network in which all nodes are of the same type and same level of size or autonomy.

HETEROGENEOUS VERTICAL NETWORK - A network in which all nodes are of different types and of different levels of size or autonomy.

HEURISTIC - A teaching/learning situation or experience.

HIERARCHICAL NETWORK - A network in which doner nodes are contacted according to a pre-determined sequence based on some known decision criteria.

"HIT" - The process of locating a needed document in the network and procuring it over the network.

HOMOGENEOUS HORIZONTAL NETWORK - A network in which all nodes are of the same type and same level of size or autonomy.

HOMOGENEOUS VERTICAL NETWORK - A network in which all nodes are of the same type but of different levels of size or autonomy.

HYPOTHETICAL SOLUTIONS - Use of quantitative decision methods fortrying out a variety of solutions in a model mode.

INFOMETRICS - The science of measuring or analyzing information systems performance or characteristics by using quantitative problem-solving methodologies.

INFORMATION THEORY - Shannon's Information Theory specifies mathematically the relations between message volume, channel capacity, message flow, etc., showing maximum information capacity of a channel.

$$C = W \log_2 (1 + S/N)$$

INFORMATION TRANSFER - The process of exchanging or transmitting information from one system to another system or from one node to another node.

INPUTS, SIGNAL - Messages received by the system which require processing and/or action.

INPUTS, MAINTENANCE - Messages received by the system that maintain its ability to function.

INPUT-OUTPUT ANALYSIS - The process of quantitatively measuring the borrowing and lending transactions in a given node or in a total network to determine net balance.

IMPLEMENTATION - The process of putting in to operations the set of previously made decisions, usually on a pre-planne schedule involving staff, space, money and time.

INPUT:OUTPUT - Messages or signals going into or coming out of the system via boundary and terminals. Require coding and decoding.

INTER-LIBRARY NETWORK - An organized, planned inter-connection of different libraries or library systems for purpose of sharing resources or services.

INTERSECTION SWITCHING - Switching between sectors on a geographic and library type matrix.

LIBRARY TYPE - The various types of libraries as traditionally defined, such as academic, special, school, public.

LINEAR PROGRAM - a problem statement where the objective or criterion function is related linearly to the decision variables and subject to given solution constraints; a method for seeking an optimum of some objectives where variables may be stated in linear form and scarce resources must be rationed among many alternative uses.

LINKAGE - The process of tie-in to a network. May be organizational but usually implies communication link.

LINKS - See CHANNELS and ARCS

LINEAR UTILITY FUNCTION -

LOCATOR FILE - A file (record) showing location of a given document.

MEANS - END CHAIN - A useful way to conceptualize the relationship between prime and instrumental objectives showing steps.

MEMORY - The storage of signal inputs.

MESSAGE - The unit of communication concerning a transaction.

MESSAGE FORMAT - The format in which the message is transmitted in; i.e.:

ILL Form
Letter
TWX
Telex
Phone
Etc.

MESSAGE TRANSFER - The exchange or transmission of message from one system to another system or from one node to another node.

MESSAGE TYPE - Messages may be of several types such as:

requesting documents
advising re status of request
confirming shipment
advising cannot ship

METHODOLOGY - The study of various methods for achieving a task.

MOBILITY OF USER/MOBILITY OF MATERIAL - Basic conflict in network concept which must be resolved in formulating network objectives.

MODEL, ANALYSIS -

MODEL, ANALYTICAL - A model which can be solved mathematically in closed form.

MODEL, CONCEPTUAL - A verbal description of basic concepts reqpresenting some real-world situation.

MODEL, DESCRIPTIVE - See MODEL, CONCEPTUAL

MODEL, DETERMINISTIC - Models having only a single value for each variable.

MODEL, ECONOMIC - An expression of the economics of a system in terms of cash flow, benefit/cost ratios, break-even analysis as influenced by changes in the system such as number of employees, number of transactions, new equipment, etc.

MODEL, MATHEMATICAL - An attempt to describe the essence of a real life condition, or the main relationships between real life conditions, by one or more mathematical equations. Such a model may permit mathematical manipulation which will identify the optimum or best "solution."

MODEL, PILOT - An experimental model of limited size designed to simulate a much larger real-world.

MODEL, PRESCRIPTIVE -

MODEL, PROBABLISTIC - Variables in the model have random values; i.e., one of several possible values each of which has a specific likelihood of being the particular value of the variable at any point in time.

MODEL, SYMBOLIC - A model using symbolic or symbolistic representation to describe a system. Example: A flow diagram, a block diagram, etc.

MODEL, SYNTHESIS -

"MODEL OF THE FIRM" - Use of modeling techniques to simulate various functions within the organization.

MODELING - The process of representing the "real world" in some extract format which permits analysis or simulation.

MORPHOLOGICAL RESEARCH - A method of analysis proposed by General Systems Theorist; a quantitative method for study of structure and form of systems, organizations, events, concepts, etc.

MULTI-CHANNEL NETWORK - A network where there exists multiple connecting channels among the libraries; a channel which permits more than one message or message types to be simultaneously transmitted - also called "Duplex."

MULTI-COMMODITY SYSTEM - A system in which more than one type of request or service can be satisfied.

NETWORK - A combination of individual libraries (nodes) into a planned cooperative effort and usually including communication channels, standard codes, and previously determined policies and procedures.

NETWORK (re Waters) - An interconnection of things (other than the printed word), systems, or organizations.

NETWORK, DIRECTED - Networks in which a predetermined sequence of action is followed for message transmittal. Also called Hierarchical Networks.

NETWORK - NON-DIRECTED - Networks in which there is no established sequence of action for message transmittal. Also called Round-Robin Networks.

NETWORK ANALYSIS - A method for scheduling complex tasks and to compute the "most efficient" combination of a series of related tasks. Two methods are:

CPM - Critical Path Method
PERT - Program Evaluation Review Technique.

NETWORK COMPONENTS - The parts of a network such as nodes and channels or links, switching center, locator file, etc.

NETWORK EFFICIENCY - The expression indicating "user satisfaction" with the network including total of efficiency of all components and functions.

NETWORK ROLE - Task delineation either by choice or by accident. Each node has its own unique role.

NODE - The smallest autonomous unit in the network through which a user can interface with the total network.

NODE ACTIVITY COEFFICIENT - The individual nodes activity as compared to total network activity.

$\frac{Bn}{Bn+Ln}$ x Bn+Ln divided by B+L for total network.

See also B/L RATIO ZONE TECHNIQUE.

NODE DEMANDS - The number of messages received or demanded at a library during a stated period of time.

NODE, INITIATOR - A library which initiates messages to other libraries within the network.

NODE, RECEIVER - A library which receives messages from other libraries within the network.

NODE, RELAY - A library which accepts messages as input and relays them to other libraries.

NODE REQUIREMENTS - The number of messages originating at a given library during a stated period of time.

NODE/NETWORK CONFLICT - Diverse goals between a node and the network.

NOISE - Random extraneous "conditions or errors" that confuse the real message; may be electrical, mechanical, humanistic, or semantic.

OPERATORS OR PROCESSORS - Components in the system which perform certain pre-determined tasks on incoming messages.

OPTIMAL SOLUTION - The best solution in terms of the stated problem; i.e., that set of decision variable values which gives the optimum value of the criterion function.

ORGANIZATION THEORY -

PARALLEL - The processing of several transactions simultaneously so that two or more are completed during the same elapsed time. See SERIES.

PARAMETERS, OPERATIONAL - The operational characteristics that identify the various functions of the institution or organization.

PARTICIPATING LIBRARY - Those libraries participating in the Pilot Model.

PRIMARY PATRON GROUP - The group of users of the system for which the system has the primary responsibility for satisfying total library needs.

PROBABILITY THEORY - Useful in dealing with the problems of uncertainty and where an act has several different possible outcomes.

PROBLEM-SOLVING - The logical analysis and synthesis of complex variables to reach alternate solutions.

PROGRAMMED DECISIONS - Decisions which are routine and repetitive in nature, thereby allowing generalization and one-time decision.

PURPOSES AND GOALS - A definition of objectives and an explicit statement of necessary constraints.

QUEUEING THEORY - Queueing occurs when (1) there is too much demand on existing facilities or (2) there is too little demand. Useful technique for scheduling for given levels of demand and assumed levels of capacity.

RANDOM VARIABLES - A variable which may have any range of values, the exact value of which at any point in time is determined by a chance process which can be described in the form of a probability distribution.

REAL TIME MODE - A system in which turn-around-time is "simultaneous" with input; i.e., minimum response delay.

REFERRAL - The process of referring a requestor to another source. The initiator node has fulfilled its responsibilities when the referral is made.

REFINED DECISIONS - The use of quantitative techniques to eliminate extraneous variables in the study of alternates.

REGION - A multi-state region including Oklahoma, Louisiana, Arkansas, New Mexico and Arizona.

RELAY - The process of switching or transferring the request to another source yet maintaining responsibility for completion of the transaction.

REQUEST - The message in which a specific bibliographic entity is requested.

REQUEST/HIT RATIO - The numeric ratio of the number of requests required before the desired document is located.

RESPONSE TIME - See TURN AROUND TIME.

ROLE SPECIALIZATION - The assignment of special tasks to specific nodes in the network.

ROUND ROBIN NETWORK - A network in which each possible donor node is contacted in series following a personalistic decision mode. Also called an "undirected network,"which see.

SECONDARY PATRON GROUP - The group of users of the system who are provided access by agreement with their primary "parent" system.

SERIES - The processing of transactions one after the other, end-to-end. The lapsed time is equal to the sum of time required on each transaction. See PARALLEL.

SET THEORY - A mathematical method of observing and analyzing "groups of items" to quantatively measure characteristic in common between all elements of the set and sub-sets.

SIGNAL ENERGIES - Energy which can do useful work.

SIMULATION - Use of large sample of transactions related to a mathematical model of a process or a phenomenon being investigated. Sample trials are performed by manipulation of the mathematical model rather than in a physical sense.

SOLUTION FINDING - The search for possible alternative solutions (i.e., proposal search) and the critical, objective evaluation of the proposed solutions. Requires a defined value system. See also OPTIMAL SOLUTION.

STATE OF A SYSTEM - The readiness of the system to perform functions. May be stable or unstable.

STORAGE - The property of the system which permits the delay of outputs beyond the minimal response time of the system.

SWITCHING - The process of relaying (or transferring) messages or documents in a network.

SWITCHING LEVEL - The geographic level (local, area, state, region or national) at which messages/documents/information is exchanged or relayed between systems.

SYSTEMS, CLOSED - Systems that function only within themselves and do not interface with other systems.

SYSTEMS, OPEN - A system which accepts and responds to inputs from without the system and is, therefore, somewhat dependent upon other systems.

TERMINALS - Access points into or out of a system.

"THREE-PARTY" TRANSACTION - A transaction involving three nodes in the network, usually a "requestor node," a relay or switching node, and a "receiver" node.

TIME SLICE - A segment of time cut-out-of a continuous process for purpose of detailed examination.

TRANSACTION - The unit of interaction between nodes including message and document transfer.

TURN AROUND TIME - Time required to receive reply or conclude transaction.

"TWO-PARTY" TRANSACTION - A transaction directly between requestor node and "receiver" node.

UNION CATALOG (re Waters) - Any compilation of printed material related by subject or format in which two or more libraries share responsibility for publishing and/or maintaining.

USER/SYSTEM INTERFACE - The "contact" between a user and the system. Boundaries must be crossed and messages decoded, etc.

UTILITY - An expressing of value system in a quantitative mode capable of measurement. May include time, cost, quality.

GLOSSARY WORK SHEET

I suggest the following terms be added to the Glossary:

	TERM	USED BY
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PRELIMINARY PARTIAL BIBLIOGRAPHY

ON

INTER-LIBRARY NETWORKS, MODELING AND SIMULATION

AND

OTHER PROBLEM-SOLVING METHODS

Compiled by

James Stephens, Richard Nance, and Maryann Duggan with the assistance of Richard Perrine, Prentice Selby and others.

March, 1969

Note to the Reader:

We welcome additions, suggestions and corrections in the attached bibliography. We believe we have listed the key publications pertinent to the RRT Institute, but welcome your assistance in making this bibliography more comprehensive.

PRELIMINARY PARTIAL BIBLIOGRAPHY

on

INTER-LIBRARY NETWORKS, MODELING AND SIMULATION,

and

OTHER PROBLEM-SOLVING METHODS

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(Title Page Only)

LIBRARY SERVICES FOR THE NATION'S NEEDS: toward fulfillment of a national policy

Report of the National

Advisory Commission on Libraries

October 1968

Copies of this reprint may be ordered from ALA Publishing Services at the following rates: single copy—35¢, 25—$7.50, 50—$13.50, 100 or more—25¢ each. Prepayment is requested for all orders under $7.50.

Reprinted from the ALA Bulletin, January 1969

APPENDIX C.4

March 7, 1969

OFFICIAL LISTENERS AND THEIR "CHARGES"

TO: ALL PARTICIPANTS AND LISTENERS — TLA REFERENCE ROUND TABLE
PRE-CONFERENCE INSTITUTE

Time is moving rapidly toward March 26!! The Reference Round Table Institute on Inter-Library Cooperative Reference Services is going to be exciting and well attended. Pre-registration is higher than anticipated, indicating possibly 250 final registrants.

The draft copy of the final program is enclosed. Also enclosed is a list of handouts which will be given to each registrant — either by advance mail or at the meeting. Copies of those now available are enclosed for your homework.

The room will be arranged in a network design with a switching center and 24 round tables pre-numbered to correspond to network nodes. Attendees and Listeners will be assigned to the node representing their type of library. We will have actual questions to be relayed through the network during the afternoon session. In addition, each attendee will be asked to:

1. Identify terminology requiring definition for use in compiling a finished glossary,
2. Network their own library using worksheets and formula provided, and
3. Actively critique the proposed ideal, statewide network.

We sincerely want full participation and involvement of all attendees.

Your role is important to the success of the Institute. In order to coordinate our efforts and to plan our own activities to best meet the objectives of the Institute, could you please meet for a briefing session on Tuesday, March 25, 8:00 p.m., Republic of Texas Room at the Rice Hotel in Houston. Final details can then be discussed with all participants and Listeners together. The "charge" for the Official Listeners will be assigned at this briefing session.

For those of you needing visual aids for your presentation, we will have an overhead projector for transparencies. If you need other projection facilities, please let me know by March 20.

See you on March 25, 8:00 p.m.!!

Maryann Duggan, Chairman
Reference Round Table
Statewide Network Planning Committee

MD:rm

Encl.

C-62

January 29, 1969 File: Title III RRT

TO ALL PARTICIPANTS IN THE TLA REFERENCE ROUND TABLE
PRE-CONFERENCE INSTITUTE MARCH 26, 1969

Enclosed is the preliminary program for the Cooperative Information and Reference Services - Library Network Institute previously discussed with you.

In addition to the program participants shown on the enclosure, we are asking the following to be "Official Listeners":

Mrs. Mary R. Boyvey
Mrs. Lillian Bradshaw
Miss Janice Kee
Mr. James Love
Mr. Stanley McElderry
Mr. Edward Montgomery
Mrs. Marie Shultz
Mr. Jim Stephens
Dr. Paul Wasserman
Mrs. Flora Wilhite
Mr. Heartsill Young

The "Official Listeners" will be so designated on the final program and will be asked to (a) sit as a group during the Institute; (b) reply to a specific "charge" and (c) present a 35-minute critique of the ideas, etc., disclosed at the Institute. In other words, the Official Listeners are the ones to identify the useful contributions and to advise us on future direction.

We have some exciting ideas about actually simulating a library network during the institute. We need your reactions to these ideas. Also, our Institute will be much more effective if all participants per the enclosed program and above list would get together to coordinate presentations. Thus, could you please come to a meeting of all Institute participants on February 18, at 8:30 a.m., SMU Science Information Center, Room 119. Most of you are getting a separate invitation to attend a Statewide Network Study Group meeting at the same time and place. We intend to merge these two functions in the same meeting to save you unnecessary travel, etc.

I look forward to seeing you on February 18.

Maryann Duggan
Maryann Duggan

MD:rm

Encl.

COOPERATIVE INTER-LIBRARY REFERENCE AND INFORMATION NETWORKS

A PRE-CONFERENCE INSTITUTE
Co-Sponsored By
TLA REFERENCE ROUND TABLE
And
THE TEXAS STATE LIBRARY

* * *

PARTICIPANTS

Dr. Ed Holley
Miss Maxine Johnson
Miss Francine Morris
Dr. Richard Nance
Mr. Richard O'Keefe
Mr. Richard Perrine
Mrs. Marie Shultz
Mr. Richard Waters

OFFICIAL LISTENERS INVITED

Mrs. Mary Boyvey
Mrs. Lillian Bradshaw
Dr. Wilson Fahlberg
Mrs. Catherine Franklin
Dr. Don Hendricks
Mr. John Hudson
Mr. Paul Janaske
Miss S. Janice Kee
Mr. James L. Love
Mr. Stanley McElderry
Mrs. Frances Neal
Mrs. Dorothy Sinclair
Mrs. Wanda Sivells
Mr. James Stephens
Mr. Forest Ward
Dr. Paul Wasserman
Mr. Robert Whipple
Mrs. Flora Wilhite
Dr. Dorman Winfrey
Miss Jan Wolford
Mr. Heartsill Young
Mr. Richard Yoes
Mr. Wyman Jones
Col. Wilbur W. Hurt

GENERAL CHARGES TO ALL LISTENERS

During the Day:

Your role is to focus attention on pertinent topics by raising questions before and after presentations. Also, your role is to interpret importance of ideas and help define problems needing attention. Collectively, you will serve as our guide to clear thinking.

Enclosed is a suggested outline for each Listeners' Reporting Period with possible questions that may be pertinent at that time. I have also suggested who among you might wish to report on that topic at that time. This schedule and these questions are only offered for your guidance. Please feel free to identify appropriate issues as you wish.

Final Report:

At the 4:15 Reporting Period, we would like to pull together the main points, clarify issues, set goals for future action, and generally crystallize the concepts, procedures, problems and opportunities for improving inter-library networks and library development in the state. This is the critical charge!

Evaluation:

The following General Charges are offered to help us improve the concepts, etc. Please be observant of and be prepared to report on:

1. Words that need definition or explanation.
2. Weakness in logic, theoretical assumptions, or practical implications.
3. Pertinency of theories or techniques to the particular task being discussed.
4. Are we on the right track? If not, where are we off?
5. Applicability of these methodologies and concepts to other states.
6. Is total inter-library cooperation among different kinds of libraries a desirable goal?
7. Are the state developments in inter-library networks compatible with national trends?
8. Future action required on design of inter-library network for Texas.

SUGGESTED SCHEDULE AND TOPICS FOR LISTENERS' REPORTS

First Report: Broad Concepts, Policies, and Network Structure

Time: 10:45-11:00

Listeners: Young, Hendricks, Wilhite, Boyvey

Questions:

1. What is the relationship between the ALA Inter-Library Loan Code and Network Development?

2. Should a state attempt to be self-sufficient in library resources and special information services?

   How do you decide the point at which self-sufficiency should be developed?

3. How do you evaluate the effectiveness or efficiency of a library network?

   What criteria should be used?

4. What effect would a Texas Union Catalog have on the reference, referral, and relay services in the state?

   How do you compute Benefit/Cost Ratio?

5. Is local switching preferable to state or national switching?

   On what basis do you make this decision?

Second Report: Questions on Barriers to Inter-Library Cooperation and Questions on the Role of the Individual Library in the Network

Time: 1:00-1:15

Listeners: Neal, Hendricks, Jones, Love, Wilhite, Wolford, Hudson

Questions:

6. What seem to be the major barriers to inter-library cooperation?

7. What are some of the psychological barriers to development of networks and how can these be overcome?

8. What are the major barriers to interfacing "networks of knowledge" and "public library networks"?

9. Do library networks strengthen or weaken the individual library?

   What are the criteria for evaluating this?

Second Report, continued:

10. Do library networks tend to downgrade the role of the local library?

11. Can a library participate in a network in which the network goals conflict with the library goals?

12. Is the concept of primary patron group valid?

13. Is Role Specialization essential in designing an effective network?

    How do you determine the various roles?

14. Is a library justified in formulating selective policies on levels of service or types of transactions permitted on the network?

15. What are the functions of an MRC?

Third Report: Questions on Problem Solving Strategies, Funding and Education

Time: 3:30-3:45

Listeners: McElderry, Wasserman, Janaske, Fahlberg, Kee, Yoes, Franklin

Questions:

16. What problem solving strategy do you think is most applicable to the analysis and design and improvement of inter-library networks?

17. How practical is the use of modeling and simulation techniques in evaluating or designing networks?

18. Is it intellectually and realistically possible to evolve a Generalized Inter-Library Network Theory?

19. What is the most important "utility" within:

    a. A library, and

    b. A network of libraries?

20. Who shall pay for networks? The members? The users? The government?

21. Is the B/L Ratio Zone technique valid for developing rate structures for individual node participation in a network?

22. What effect will functioning library networks have on reference librarians in their day-to-day tasks?

23. What effect (or effects) will network development have on library education?

    On continuing education for on-the-job librarians?

Final Report: Questions on Laws, Statewide Planning, and General Charges

Time: 4:15-4:45

Listeners: Winfrey, Ward, Young, Boyvey, Sivells, Kee

Questions:

24. What laws (local, state, federal) influence network development--favorably or unfavorably?

25. Are contractual library service agreements possible and legal in Texas among different types of libraries and different governmental units?

26. How could the existing networks in Texas be redesigned to enhance their "utility"?

    Who should be responsible for this re-design?

27. Who is responsible in Texas for

    a. Statewide planning of library development

    b. Inventorying resources

    c. Designing systems

    d. Setting standards

    e. Training librarians?

28. Who or what agency should be doing statewide library planning for ALL types of libraries in the state?

APPENDIX C.5
FORMAL PAPERS PRESENTED DURING
REFERENCE ROUND TABLE INSTITUTE
March 26, 1969

Page

(a) Recent Developments on the National Scene, by Richard Perrine C-69

(b) Networks for Knowledge: Title VIII of the Higher Education Act of 1965, by Edward G. Holley . . . C-73

(c) Survey of Cooperative Ventures in Texas Libraries, by Richard Waters C-77

(d) Preliminary Evaluation, Texas State Library Communication Network, by Marie Shultz. C-118

(e) Reference Librarians and Networks: Houston Case Study of LSCA, Title III Special Project, by Richard O'Keeffe C-124

(f) The Dallas Pilot Model Project, by Maryann Duggan . C-127

(g) Strangle the Machine, I Can't Hear Myself Think, by Margaret F. Morris C-135

(h) Model Library Networks and Library Network Modeling, by Richard Nance C-146

C.5-a

RECENT DEVELOPMENTS ON THE NATIONAL SCENE

By Richard Perrine*

The bibliography included among the materials supplied to the registrants of this institute is merely a preliminary partial bibliography, but it gives ample evidence in the variety of books and articles cited that cooperative library ventures (or interlibrary networks) are being carefully examined on the local, regional, nationa, and international levels. The bibliography's Section A on Networks and Networking contains two citations, numbers 9 and 10, to articles in the current issues of Library Quarterly and Library Trends, repsectively. These two publications of January 1969 are entirely devoted to articles on interrelations among different types of libraries and on existing library or information systems. Such concentration on the subject virtually forces librarians to become "network conscious."

The Library Trends issue is entitled "Developments in National Document and Information Services," and its articles on India, Latin America, Japan, South Africa, Canada, Scandinavia, United Kingdom, United States, and Soviet Union each have lessons for us. The article on India mentions an organization, a National Institute on Technical Information, which is called "NITI." Perhaps this could be combined with a new unit to be named "Global and Regional Institute for Total Information." We should certainly be able to get to the heart of the network matter with a structure known by the acronym of "NITI-GRITI."

Library interdependence is increasing on the local scene in Texas, as elsewhere, and I am sure that everyone present today has participated in some form of cooperative library venture, if not in one of the organized networks operating in the state. These tentative patterns of collaboration are described in the Library Trends article on Scandinavian countries as being "like a map of small country roads with a few cross-roads over the national border." The development of more comprehensive coverage is likened to "the planning of an interstate highway system." The analogy is good, but oversimplified.

Recent developments on the information scene in this country, with its great varieties of media, methods of communication, and libraries, more closely resemble the complex integration of all forms of transportation: airplanes, ships, railroad trains, as well as highway vehicles, both public and private. The fine articles by Joe Becker, particularly that in Library Trends and the one co-authored by Wallace Olsen in Volume 3 of the Annual Review of Information Science and Technology, delineate this complicated mosaic and provide what is probably the most thorough current coverage of networks in this country. In the limited time here today I can only tell you what I know about a few small pieces of the overall scene.

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*Mr. Perrine is Reference Librarian, Rice University, Houston, Texas.

As you may know, Maryann Duggan, the chairman of this institute, is to be one of the two speakers at a program on library networks during the Atlantic City conference of the American Library Association this June. I believe that I can most effectively convey views on national developments by referring to them in relation to the evolution of the plans for the Atlantic City program.

The national information network-conscious attitude is essentially recent in origin and certainly not exclusively the property of librarians. Joe Becker describes network plans and developments under way in libraries, education, government, industry, and professional societies. Although the American Library Association included among its 1967 Goals for Action a provision for "establishment of a network between libraries to make available to all citizens the full range of their resources," the development of national systems to handle information is also of active interest to groups such as the following: The American Society for Information Science; Association for Computing Machinery; COSATI, the Committee of Scientific and Technical Information of the White House Office of Science and Technology; EDUCOM; CONLIS; and others. Librarians who were aware of the activities of these organizations became concerned about the consequences if a strong move was not made toward the implementation of the stated A.L.A. goal. They felt a danger that American libraries might be forced, by default, to accept decisions which would not be in harmony with the total goals of library service for the nation, or, decisions which represented partial solutions, likely to prove incompatible with the total system which must inevitably be designed for comprehensive library service.

The direct result of this concern was a combined effort by representatives of three A.L.A. divisions which felt they had a particular stake in the future of library networks. In November of 1967 the Reference Services, the Resources and Technical Services, and the Information Science and Automation Divisions collaborated in drawing up a proposal for a Spring 1969 conference to identify and define the basic propositions fundamental to the establishment and operation of library networks on a national scale. The conference involved preparation of three commissioned papers, a three-to-five day meeting of 20 leaders from library, communication and other fields, and a report to be made to the profession at the Atlantic City conference this June. The estimated cost was $24,000 and funds were sought by applying for the 1968 J. Morris Jones-World Book Encyclopedia-A.L.A. Goals Award.

The proposal failed to win the award and the librarians representing RSD/RTSD/ISAD looked around for other possibilities. They realized that lively interest prevailed in the Federal Government in support of the information network concept and they learned that the U. S. Office of Education had been considering a similar conference on networks. During A.L.A.'s conference last June in Kansas City the librarians met with officials from U.S.O.E. to discuss their common interest. As a result two meetings were held in Washington during the fall of 1968 to consider the general goals of a potential conference on networks and how such a conference should be planned. Early this year the three A.L.A. divisions submitted a new proposal for "A Conference on Interlibrary Communications and Networks" to the U. S. Office of Education. This would be a five day working conference of two hundred knowledgeable persons to study the entire problem. Up to thirty experts would prepare background papers dealing with the history, present state of development, available technology and rationale of networking. Using these background papers as a foundation, the conference attendees, working in small groups, would summarize developments, point out significant trends, outline the steps in a national network development plan, and propose additional research to implement such a plan. The minimum budget for this proposal is $90,000 and the conference would probably be held in the spring of 1970. The proposal is still under consideration.

The original RSD/RTSD/ISAD proposal of early 1968, which was not funded, included a joint program meeting this June at Atlantic City to report on the conference. This subject was no longer possible but the three divisions agreed to sponsor a program with the title "Resources and Services: Expanding Modes of Access." Joe Becker will talk on "Telecommunication Networks: Background and Definition," and Maryann Duggan will speak on "Library Networks and Library Service." It is scheduled for Wednesday morning, June 25th, from 10 to 12, and I hope that many of you who are present here today will be able to take in that program.

C.5-b

NETWORKS FOR KNOWLEDGE:
TITLE VIII OF THE HIGHER EDUCATION ACT OF 1965

By Edward G. Holley*

Potentially one of the most promising pieces of federal legislation enacted during the past year is Title VIII of the Higher Education Act of 1965, "Networks for Knowledge." Its basic aim, as stated in the act itself, is to promote the sharing of all kinds of resources among institutions of higher education. Specifically signaled out for mention are libraries, closed-circuit television, and computers, though the last mentioned has a restriction on the costs of central computer facilities and administrative terminals. Surprisingly libraries get the most mention of all in this particular act, which is included in one of your handouts today. In addition to the normal encouragement of joint use of libraries, including joint use of necessary books, materials, and equipment, there is specific encouragement for the preparation of library systems and educational media. Surely any cursory reading of this new title to the Higher Education Act gives promise for substantial assistance to our colleges and universities.

However, the broad-ranging nature of the title itself and the limited amount of funding requested by the out-going administration, raises some serious questions about how quickly its somewhat grandiose promise will be fulfilled. Although the title actually authorizes some $4,000,000 for Fiscal Year 1970 and $15,000,000 for Fiscal Year 1971, the Johnson administration budgeted only $750,000 for Fiscal Year 1970. At this point we do not know what alterations the Nixon administration will make in the budget for next year, nor do we have a clear indication that even the $750,000 will actually be appropriated. In this connection one is reminded very much of the initial funding of LSCA Title III: much was promised but little has been forthcoming up to this point in time. Certainly one of the very clear needs on the part of those who do want to see this program operable is for strong lobbying efforts with the current Congress. I would certainly urge you to make your views known on this matter to your own congressmen and senators, and that right away.

---

*Dr. Holley is Director of Libraries, University of Houston, Houston, Texas.

"Networks for Knowledge" was passed by the Congress and signed into law in mid-October, 1968. What has been done since that time to prepare for the various proposals which will surely come if funding is provided in the next fiscal year? In late December, 1968, the Office of Education appointed a Task Force from among its constituent branches which would be interested in the Title's various provisions. Responsibility for the implementation of the title was lodged with the Bureau of Higher Education and heading the Task Force is Dr. William Adrian from the Division of College Support. The Library Services Branch is represented on the Task Force in the person of Dr. Katherine Stokes, College and University Library Specialist. For the past three months this task force has been hard at work drawing up the Draft Regulations and the Instructions for Submitting Applications. On the whole, the Task Force has done an admirable job, but the largest share of credit should certainly go to Dr. Adrian, its chairman.

In addition to the Office of Education personnel, Dr. Adrian has appointed a group of consultants from a wide variety of organizations to give his Task Force advice on the general direction and priorities to be established under provisions of the Act. The first group of consultants met on January 23 and again March 14. That particular group included representatives from the American Council on Education, the Great Lakes College Association, the Kansas City Regional Council, EDUCOM, and several other groups, with yours truly representing college and university library interests. We were asked to criticize the various drafts and to give our own input into the Task Force deliberations. A subsequent group representing other interests met last week and the Office of Education hopes to pull together the divergent views in final form by late next month. Tentatively Dr. Adrian hopes to send out the instructions by June 1 with a deadline for submission of proposals either on September 1 or October 1, 1969. I say "tentatively" because these dates will be subject to alteration depending upon Congressional appropriations.

Because of the limited funds likely to be available during the fiscal year 1970 there is little doubt that project support will focus on comprehensive planning and/or pilot demonstration projects for establishing new cooperative arrangements or improving the effectiveness of existing arrangements. Frankly, it seems likely that the Office of Education will choose to fund several large projects rather than a host of small projects, though the latter are not completely ruled out. I would guess that those projects with the best chance of success will come from already existing, formally organized cooperatives, where contractual arrangements exist among institutions. It seems extremely unlikely to me that any new group of institutions can organize themselves into a viable unit and submit an attractive proposal within the constraints of time now operating. This it would appear that the I.U.C., R.I.C.E., CORAL, etc. are in the best position to make proposals under the "Networks for Knowledge" title.

Should the small amount of money available and the other constraints operating on the first fiscal year deter institutions from applying? As a practical political view, no, for future funding will in part depend upon making Congress aware that there is so much interest in this title that the Office of Education could fund only an insignificant number of the proposals it received. Moreover, I think it imperative for library networks to submit excellent, innovative proposals the first time around since they will now and in the future compete with such expensive proposals as computers and closed-circuit television. This title was not written solely for libraries, but we have been in the cooperative sharing business for a long time and should be the best prepared to make use of such funding. Therefore I would urge that you give serious attention to the instructions when they appear and to consider carefully the submission of a proposal for your existing or evolving library network.

I regret that I won't be able to be with you during the rest of your deliberations today but I do hope that you will look upon Title VIII as an opportunity and that you will let me know if there is any way I can help you in your resolution of this most important problem: how _do_ we obtain the best network for our Texas libraries?

C.5-c

SURVEY OF COOPERATIVE VENTURES IN TEXAS LIBRARIES

By Richard Waters*

What does CORAL have in common with R.I.C.E.? W.I.N. with TAGER? TAC with TEX TAN?

What similarity exists between the *Catalogue of Research Facilities in Texas* and *New Serial Titles*? Between the *Union List of Periodicals for the Top 26 Counties of Texas* and *The Texas List*?

The former are all "networks" presently serving Texas libraries. The latter are "union lists" which are also assisting libraries and librarians in Texas. All are, for the purpose of this paper, "cooperative ventures."

I have defined a "cooperative venture" as being any activity involving two or more libraries and/or other agents.

Before we peek at the many "ventures" now in Texas, let me first bring you up-to-date on how the data was collected, by whom, and point out in advance some of the weaknesses of the survey.

Richard Perrine, in his "Survey of Reference Services in Texas Libraries" (Appendix C, 1968) listed 54 "union lists, regional catalogs and cooperative ventures" which were reported by Texas libraries. Those 54 lists, catalogs and ventures served as the base for this survey. As was the case last year, a coordinator for each MRC district was appointed by the Reference Round Table Chairman and made responsible for collecting data from specific ventures as listed by Perrine plus others they were aware of.

Many fine Texas librarians have had a hand in this survey. If any good comes from it, it is due to their work. They are: Fred Abrams, Rice University; John Chaffin, Dallas Public Library; Shelah-Bell Cragin, El Paso Public Library; Janice Gohmert, Fort Worth Public Library; William Gooch, Ector County Public Library; Alice Green, Amarillo Public Library; Margaret Hancock, Texas A & I University; Robert Joyce, Dallas Public Library; Katherine Montague, Trinity University; Richard O'Keeffe, Rice

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University; Col. Stanley Reiff, Inter-University Council; Helen Smith, University of Texas; Barbara Wade, Abilene Public Library; and Ruby Weaver, Houston Public Library.

The data gathering began last August. Most of the work was done by mail. And therein lies the weakness of the survey. Volunteer projects produce good work. And this one has. But they also lead to inaccuracies, misinterpretations, incompleteness. I am sure that if all of us who had a hand in this survey could have personally visited each venture surveyed, answered their questions, interpreted all questions the same, we - and you - would have a better product.

Forty-seven ventures have been surveyed. Some of those reported in 1968 were found to be listed more than once but by a different name; i.e., the above mentioned CORAL is an acronym for the Council of Research and Academic Libraries, San Antonio, Texas. The "SMU Industrial Associates" is correctly, I believe, the Industrial Information Services (I.I.S.), headquartered at Southern Methodist University.

Some others apparently have ceased to exist: i.e., the "Dallas List" and a "Union List of Serials in Dallas/Fort Worth Area." Still others have merged into larger projects, as was the case of the *Union List of Scientific Serials in the Corpus Christi Area* becoming a part of *The Texas List*.

The forty-seven have been divided into two broad categories: Networks and Union Lists. For the survey a Network has been defined as: An interconnection of things (other than the printed word), systems or organizations. A Union List has been defined as: Any compilation of printed material related by subject or format in which two or more libraries share responsibility for publishing and/or maintaining.

The "Networks" and "Union Lists" have been further divided geographically. The divisions are:

Local - Encompassing not more than four MRC Districts.

State - Encompassing five to ten MRC Districts.

Regional - Encompassing all or a portion of Texas plus extending into at least one other state. (A further division was made with regard to Networks by distinguishing between those headquartered in Texas and those whose headquarters are in another state.)

No attempt was made to survey national networks (i.e., EDUCOM, MEDLARS), nor all but a few regional national union lists.

What type of information did we attempt to gather: We wanted name, address and geographic coverage. We wanted to know something about their organization, was it on a formal or informal basis? Did they have a sponsor? How were they governed (Director, Board, Committee, etc.)? Means of finance ? Something about their staff and their last annual operating budget. These we classed as being identification factors.

From identification we turned to the scope of their being. Who were the participants and/or contributors? The consumers of their service or product? What type of service did they provide (cooperative acquisitions or processing, interlibrary loan, literature searches, etc.)? And the type of communications equipment they utilized?

Finally, we asked about the growth of the venture from first year to last and their long-range goals or plans.

We also wanted to determine the interfacing between networks in Texas. On this score, to use a term contained in your glossary, we "bombed - out." Why? Because "interface" appeared as "interfere." As you would expect, no one said their venture interfered with another venture. So much for proofreading.

The survey, except for bringing together a few loose ends, is now complete. What does it tell us about networks and union lists in Texas?

Let us first look at our union lists.

On a local basis we find three excellent lists in Houston, each appearing to be directed or maintained by the major libraries in the area.

Newspaper Resources of District V: A Union List, is a project of the University of Houston. It is now available upon request from the University. Houston Public is responsible for a union list of periodicals in its MRC area. A *Union List of Winchell Titles* is being maintained and kept current on computer by Rice University.

Two other good periodical holding lists are those in San Antonio and Amarillo. The former is confined to the larger libraries of that city. The *Union List of Periodicals for the Top 26 Counties of Texas* is now serving Amarillo and vicinity in its first edition with a revision on the way.

The Winchell project has an ambitious goal: "A statewide union list of Winchell Titles, including those in supplements as published, with future remote access by teletype." Dallas area librarians are now investigating a project similar to this, so perhaps the goal is not beyond reach.

By far, the most important statewide union list is *The Texas List*. Now a commercial venture belonging to the Houston firm of Phil Wilson, Publisher. The scope of this journal list was enlarged last year to take in titles in the fields of business, commerce, and industry - in addition to science and technology. The long-range goal of editor Harold Richardson is to expand into the humanities and social sciences by 1971-72. However, it is my understanding that unless sales of the list sharply rise in the near future this goal will be postponed if in fact ever attempted. We, you and I, must not let *The Texas List* die.

Three lists, or catalogs, of a specific nature are: *The Catalog of Genealogical Materials in Texas Libraries*, a State Library project; the *Union Catalogue of Texana*, housed in the University of Texas at Austin Baker Library; and A. & M.'s *Catalogue of Research Facilities in Texas*.

The latest addition to the state scene is the Union List of Serials of Texas Health Science Libraries, sponsored by the Texas Council of Health Science Libraries.

Our survey of regional and/or national union lists/catalogs is by no means complete - nor was it intended to be. Included are such well known works as the Union List of Serials and New Serial Titles, to which 29 and 18 Texas libraries report their holdings.

A specialized list is that of the Public Utilities Section of Special Libraries Association, the Union List of Serials for Public Utilities Libraries.

Two Texas libraries, the University of Texas at Austin and Trinity University, report their holdings of materials relevant to the study of Presbyterianism to the Presbyterian Historical Society in Philadelphia for inclusion in the Union Catalog of Presbyteriana.

Thirteen college and university libraries in the state participate in Masters Theses in Pure and Applied Sciences.

From union lists and catalogs, let us turn our attention to the other half of the survey - networks. We earlier defined a network as being an interconnection of things (other than the printed word), systems or organizations.

Networks should also possess certain characteristics. They are (A) formal organization, (B) a means of communication, (C) bidirectional operation, and (D) switching capability and a directory. These characteristics will not be found in all Texas networks.

We find ten Local Networks. Two of them, TAGER and TEMP, are educational TV networks - but with capabilities to perform "library" services. For instance TEMP (Texas Educational Microwave Project) states: "Our microwave facilities could be adapted with little cost to serve library interconnection . . . "

One of the oldest local networks is the Inter-University Council Private Line Teletype Network, I.U.C. for short. Established principally to expedite interlibrary loans between eight institutions in the Dallas/

Fort Worth area, it is now used for reference assistance and through its sponsor, the Inter-University Council, is planning a union list of newspapers, cooperative acquisitions, and processing. It is working with TIE (Texas Information Exchange) and I.I.S., thus increasing its own potential level of service as well as that of the other two agencies.

The newest local is based here in Houston - SETINA - translated to read South East Texas Information Network Association. Headquartered at KUHT-TV, it consists of the "fifteen state supported colleges and universities within the counties in the Houston MRC area." SETINA has as a goal: "A desire to serve the needs of the colleges and schools within our area through a sharing of resources, both local and imported, and to develop materials which will strengthen each institution." They also hope "to implement communication among institutions and to build a cluster of services geared to the needs of each member."

The Western Information Network Association (W.I.N.) was created by Texas Law H.B. 692. SETINA is also a result of that legislation.

Based in Lubbock, W.I.N. is composed of eighteen state and junior colleges in West and Northwest Texas. The wealthiest of the ten local nets, its budget last year was $100,000 - with plans to request $9.5 million for the next biennium. Much of that will be for capital outlay to cover construction costs of microwave towers. Although not designed as a library network, "W.I.N. will be a multi-user network and libraries will share with other users on a basis to be determined . . . " However, the broad band width of the planned network indicates little initial constraint on users.

The Council of Research and Academic Libraries (CORAL) is a prime example of cooperation at its very best. Consisting of academic and research libraries in San Antonio, plus Texas Lutheran College and Southwest Texas State, their list of achievements should be the envy of every other metropolitan area in the state. For instance: Each member library has selected certain subject areas to develop so as not to overlap unnecessarily with one another; a delivery service speeds interlibrary loans; reference assistance is provided; a computerized pilot list of the journal holdings of three academic members is nearing completion; shared book storage, using the old San Antonio Public Library Central Building, is available; and a directory of members has been printed which lists subject strength, hours of service and the like. If the other metropolitan areas of our state were as well organized I feel we would be a lot closer to a true state network.

Why is the Knowledge Network not included in this report? It is my understanding that it is a child of the Coordinating Board and is still in the formulative stages. The idea has been approved - the funding is to come.

From the local level we move to state networks. Five statewide operations have been reported. Two, the Council of State College Librarians and T.I.E. (Texas Information Exchange) are concerned with the academic world. The public libraries are looked after by the State Library's Telex-based network. The Texas Council of Health Science Libraries, Inc. network aids these special libraries. The fifth member of this group, the State Technical Services Institute at Texas A. & M. has industry as its main customer.

As a group, the state networks are not as well organized as the local networks, not as well financed, and they do not have the range of services of the locals. I shall let you draw your own conclusions.

As stated earlier, regional networks have been separated between those based in Texas and those serving Texas libraries but headquartered elsewhere.

Three of our four regionals with Texas headquarters are a result of federal legislation - the State Technical Services Act.

These are Industrial Information Services (I.I.S.) of Dallas; R.I.C.E., Regional Information and Communication Exchange in Houston; and Texas Technical Applications Network (TEX TAN). The latter is in reality the parent of the former two plus the state network at College Station.

The principal thrust of these three is to serve business and industry. In order to do this, they have of necessity linked up with other local, state, regional and national networks and information centers. Thus their data base is much greater than that of any state or local network in the state.

The other Texas regional network is the Texas MEDLARS Search Station, whose service reaches into Arkansas, Louisiana, New Mexico and Oklahoma from its Texas Medical Center headquarters.

Five regional networks with non-Texas headquarters were surveyed. Two are located in Albuquerque, New Mexico; one in Denver, Colorado; and the remaining two, Medical Library Association - Southern Regional Group and the Southwest Academic Library Consortium, report their "headquarters" move with the office of the current chairman.

The Technology Application Center utilizes facilities at the University of New Mexico. Much of its strength is a result of its hookup with NASA.

The other New Mexico operation is the Southwestern Union List of Serials. Its inclusion in the network grouping stems from its completed questionnaire which states that interlibrary loans, reference assistance, literature searches and current awareness information and/or abstracting services are provided by the agency. This may be an excellent example of my earlier mentioned fear - dependence on the mails with the possible result here of a Union List being classed as a network.

The elder statesman of all ventures surveyed is the Denver based Bibliographical Center for Research, Rocky Mountain Region. It dates to at least 1935 when a $35,000 grant from that greatest Friend of a Library - Andrew Carnegie - got it off the ground.

As one reviews the services of these regional networks in comparison to the state and local organization, three points stand out:

1. Regionals provide a fuller range of services. Only one state network, Texas State Library Communication Network, undertakes literature searches - and this is qualified by saying "to some extent." Current awareness abstracting is provided by the Council of State College Librarians and no other state or local service. No local "net" performs lit searches.
2. Apparently only the regionals attempt to place a monetary value on information by making specific charges for work performed. For instance, a Custom Interest Profile with twenty-four updates per year will cost you $250 from Technology Application Center. R.I.C.E.'s charge for a reference question is $5.
3. Except for W.I.N., regional network budgets are considerably higher than those of their state or local counterparts.

It would appear that these factors are related. More services are a result of larger budgets which come via membership or user fees. Public and academic libraries - should we be listening?

So we are now to the end of the road. With a once over lightly we have surveyed nearly fifty cooperative ventures now serving Texas. Undoubtedly we have missed some. Our apologies if you feel slighted. Along the way we have asked a few questions - made a few observations. Where has our journey taken us?

Without wishing to steal the thunder of the Texas State Library, I believe Mrs. Shultz will tell us that the "hit" ratio of the State Library Network is very low. I feel confident that one reason for the low batting average is that we don't know where our materials are located. We need a bibliographic center - or centers - in Texas - and soon. And it appears that we may be closer to one than we think. If we could combine The Texas List with the other local and state periodical and newspaper union lists now existing we would have a good base. Add to these the specialized catalogs we now are aware of and our data base would be on firm footing.

We must also put our heads together and settle on a common communication carrier in addition to the telephone. Will it be Telex, TWX, teletype, TV or what? Let us get together. It makes little sense to me that we at the Dallas Public Library can communicate via a high speed printed message with El Paso Public Library, yet we can't do the same with Southern Methodist University.

And last - let us also give serious thought to the value of information. Any true statewide network we plan is going to cost money - a lot of money. Can we forever give away our service? I ask this question as a public librarian who has always been a proponent of "free" library service. But I am now beginning to have some doubts about the wisdom of that philosophy.

This survey should not be allowed to stand without serious questioning. I feel it raises as many questions as it answers. Let us consider it an early step in a journey toward a Texas Library Network.

SURVEY OF LIBRARY NETWORKS SERVING TEXAS LIBRARIES

Please Read Carefully Before Completing.

The information provided via this questionnaire will constitute an important portion of the 1968-69 Reference Round Table program and Institute. Your assistance will enable all Texas libraries to give better reference service.

Please be as specific as possible where necessary--generalize when necessary. Some questions will require more than one answer.

You will not be able to answer all questions. Please indicate by noting: answer not available (ana).

Thank you for your cooperation.

A. Identification.

1. Name of Network____

2. Headquarters address____________________________________

____

3. Name of Director____

4. Does Network cover more than one MRC area? Yes______No______

a. If answer is Yes, state coverage_________________________

____

B. Organization.

6. What is the basis of the organization?

a. Formal: Incorporated_______ Contract_______Agreement_____

Other____________________________________

____

b. Informal: Custom_______Oral agreement_______Other_______

____

7. Is there a sponsor(s)? Yes _________ No _________

   a. If answer is Yes, please detail ____________________________

8. How is the Network governed?

   a. Director ________

   b. Director + Administrative Board ________

   c. Director + Advisory Board ________

   d. Administrative Board ________

   e. Advisory Board ________

   f. Other ____

9. How is the Network financed?

   a. Contributions ________

   b. Government grants ________
      bb - List grants/agencies and explain ____________________

   c. State and/or local taxes ________

   d. Costs absorbed by each institution without specific provision ________

   e. Fee structure ________
      ee - List schedule and explain ____________________________

   f. Memberships ________
      ff - List type and explain ______________________________

   g. Other ____

10. How is Network staffed? ______________________________________

11. Last annual operating budget? __________________________________

C. Scope.

12. Who are the participants and/or contributors?

a. A list is not required but rather general statements, i.e., "private corporations", "small and medium size public libraries", etc. ______

13. Who are the consumers?

a. Answer as #12 above ______

14. What is the nature of the service rendered? (Define categories, limitations, levels of switching.)

a. Cooperative acquisitions (subject area, type of material) ______

b. Cooperative processing ______

c. Interlibrary loan ______

d. Reference assistance ______

e. Literature searches ______

f. Current-awareness information and/or abstracting ______

g. Union lists:
gg1. Books ______

gg2. Journals ______

gg3. Other materials ______________________________

____

h. Other ____

____

15. What equipment is utilized?

a. Teletype _______ Telex _______ TWX _______

b. Telephone _______

c. Computers _______
cc. Type, i.e., IBM 1401? ______________________________

____

d. Other EDP equipment ______________________________

____

e. Other ____

____

16. Publications of Network _______

a. Please enclose sample(s) _______

D. Growth of Network, from first year to last reporting year?

17. Participants and/or contributors ______________________________

____

18. Consumers ____

____

19. Financial ____

____

20. Service rendered ______________________________________

____

21. Book and/or journal titles ______________________________

____

E. List other Texas Networks or Networks operating in Texas that you are aware of. ____

F. Does your Network interfere with any other Network? _______

22. If answer is Yes, please list and explain ____________________

G. Long-range plans and goals of Network? ____________________

H. Other comments? ____________________

If your Network performs "reference" work, will you please answer the following, by percentages?

23. Specific item inquiries _______

24. "What do you have on this topic?" inquiries _______

25. Comprehensive literature search of resources at hand _______

26. Topic search using resources of other Networks, libraries _______
(Note: 23 - 26 should total 100%)

27. How often do you:

a. Refer patron to another Network/library if you can not answer his question nor have specific item? _______

b. Tell patron you will obtain needed material for him from another Network/library? _______

c. Neither a nor b?

(Note: a - c should total 100%)

I. LOCAL NETWORKS

A. Identification

1. Name, address, geographic coverage and survey code designation

The Association for Graduate Education and Research
of North Texas, i.e. TAGER (LN 10)
Dallas, Texas
"Dallas and Fort Worth MRC areas."

Centralized Processing Center (LN 20)
Fort Worth Public Library, Fort Worth, Texas
"Thirty members in north and central Texas."

Council of Research and Academic Libraries, i.e. CORAL (LN 30)
Trinity University Library, San Antonio, Texas
"San Antonio MRC."

Inter-University Council Private Line Teletype Network,
i.e. IUC (LN 40)
Library, University of Texas at Arlington, Arlington, Texas
"Fort Worth and Dallas MRC areas."

Midland-Odessa Union Exchange List of Serials (LN 50)
Headquarters not known
"Lubbock MRC."

Odessa-Midland Public Libraries Reciprocal Borrower's
Agreement (LN 60)
Headquarters not known
"Lubbock MRC."

South East Texas Information Network Association, i.e.
SETINA (LN 65)
KUHT-TV, University of Houston, Houston, Texas
"Houston MRC."

Texas Educational Microwave Project, i.e. TEMP (LN 70)
KLRN-TV, Austin, Texas
"Austin and San Antonio MRC areas."

West Texas Film Circuit, Inc. (LN 80)
Abilene Public Library, Abilene, Texas
"Abilene, Fort Worth and Lubbock MRC areas."

Western Information Network Association, i.e. WIN (LN 90)
Lubbock, Texas
"Abilene, Amarillo, El Paso and Fort Worth MRC areas."

B. Organization

1. Is Network organized on formal or informal basis?

   a. Formal
      Agreement - 4 (LN 20, 30, 40 & 60)
      Incorporated - 2 (LN 70 & 80)
      Charter - 1 (LN 10)
      State Law (HB 692) - 2 (LN 65 & 90)

   b. Informal
      Oral Agreement - 1 (LN 50)

2. Does Network have a sponsor(s)?

   a. No - 7

   b. Yes - 3
      Interuniversity Council (LN 40)
      University of Houston (LN 65)
      University of Texas at Austin, Department of Radio-Television (LN 70)

3. How is Network governed?

   a. Administrative Board - 2 (LN 80 & 90)

   b. Other - 6
      Board of Governors and Board of Trustees (LN 10)
      Coordinated by Order Dept. of Fort Worth Public Library (LN 20)
      Board of Directors, two from each member institution. Officers elected are a President, Vice-President and Secretary/Treasurer (LN 30)
      Directors of IUC plus Executive Secretary (LN 40)
      Each state supported institution that joins is represented by its President or his representative (LN 65)
      Director, Administrative Board plus staff consisting of a Coordinator and an Operations Manager (LN 70)

4. How is Network financed?

   a. Contributions - 2 (LN 10 & 70)

   b. Government grants - 2 (LN 10 received grant from Texas State Library. An NDEA Title VII grant built LN 70 system, other grants have produced TV programs.)

   c. State and/or local taxes - 2 (LN 65 & 90)

   d. Costs absorbed by each institution without specific provision - 5 (LN 10, 20 (for actual purchase of books), 30, 50 & 60)

   e. Membership and/or user fees - 3

Standard fees for inter-institutional per credit hour courses range from $40 to $60. Fees for courses offered to industry are $50 per semester hour (LN 10)
$75 per month plus proportionate cost of overhead (LN 40)
$1,000 each initial year - $500 per year thereafter (LN 80)

5. How is Network staffed?

Executive Director plus personnel of participants (LN 10)
Fort Worth Public Library Technical Services Dept. staff (LN 20)
Sponsor provides central administrative and fiscal staff. Each participant provides necessary local staff (LN 40)
Coordinator, Operations Manager, clericals and production assistants (LN 70)
Staff of administrative library (LN 80)
Full-time salaried staff (LN 90)

6. Last annual operating budget?

$55,000 (LN 20)
$ 7,500 (LN 40)
$69,498 (LN 70
$ 3,500 (LN 80)
$100,000 (LN 90)

C. Scope

1. Who are Network participants and/or contributors?

"Seven private colleges and universities in Dallas/Fort Worth MRC area" (LN 10)
"Small and medium size public libraries" (LN 20)
"Academic and research libraries of San Antonio, but including Texas Lutheran College and Southwest Texas College at San Marcos" (LN 30)
"Libraries at NTSU, TWU, SMU, TCU, SMS, UTA, U of Dallas, and Bishop College" (LN 40)
"Public and college libraries" (LN 50)
"Odessa and Midland libraries" (LN 60)
"The fifteen state supported colleges and universities within the 31 counties indicated above" (LN 65)
"Public and private institutions of higher education" (LN 70)
"Public libraries" (LN 80)
"Eighteen state and junior colleges in West and Northwest Texas" (LN 90)

2. Who are the consumers?

"Same as above plus employees of major industrial firms in area" (LN 10)
"Small and medium size public libraries" (LN 20)
"The same institutions and their patrons" (LN 30)

"Staff, faculty and students at colleges and universities listed above" (LN 40)
"Same" as #1 above (LN 50)
"Residents of both counties" (LN 60)
"Same" as #1 above (LN 65)
"Undergraduate students in survey courses in the core curriculum of humanities and social sciences" (LN 70)
"Patrons of participating libraries" (LN 80)
"Same" as #1 above (LN 90)

3. What is the nature of the service rendered?

   a. Cooperative acquisitions - 2 (LN 30 reports that each library has selected certain subject areas to develop so as not to overlap unnecessarily with one another. LN 40 says "under development")

   b. Cooperative processing - 1 (LN 20 only. However, LN 40 says "under study")

   c. Interlibrary loan - 3 (LN 30, 40, & 65, which is loan of videotapes)

   d. Reference assistance - 4 (LN 30, 40, 50 & 65)

   e. Union lists:
      Journals - 2 (LN 30 has computerized pilot list of the journal holdings of Trinity University, San Antonio College and St. Mary's University which is to be completed in early 1969. LN 50 has holdings of each library)
      Other materials - 1 (LN 40 preparing union list of newspapers for Dallas-Fort Worth region)

   f. Other service:
      Closed circuit classroom instruction provided by LN 10, 65 & 70
      LN 30 has shared book storage for members
      Service of LN 60 is direct use of either library by residents of either county
      LN 80 provides 16mm films in packets rotated to each library over 6-week periods
      Two-way video and audio with additional voice grade circuits for any type of terminal connection desired part of LN 90

4. What equipment is utilized?

   a. Teletype - 3 (LN 30, 40 & 90)
   b. Telex - 2 (LN 30 & 90)
   c. TWX - 1 (LN 90)
   d. Telephone - 3 (LN20, 30 & 90)
   e. Computer - 2 (LN 30 uses IBM models 1401 and 360-44; LN 90 states "any 3rd generation computer")
   f. TV and/or microwave - 4 (LN 10, 65, 70, & 90)

D. Growth of Network

1. Participants and/or contributors:

   "Seventeen first year, 30 second year" (LN 20)
   "Nine members original charter to present 11 members" (LN 30)
   "Started with five schools, now includes eight plus interchange with TIE" (LN 40)
   "1961 enrollment of participating institutions about 30,000, now about 45,000" (LN 70)
   "From six to seven" (LN 80)
   "From 12 to 18" (LN 90)

2. Consumers:

   "Original TV enrollment about 1,000. Spring 1969 enrollment in TV about 3,600" (LN 70)
   "Same as #1 above" (LN 90)

3. Financial:

   "As a cooperative group, the council members which were academic libraries were highly successful in receiving funds under the Higher Education Act of 1965, Title IIA" (LN 30)

   "Original budget about $40,000 per annum. Present budget about $70,000 per annum" (LN 70)

   "$100,000 now, $9.5 million requested" (LN 90)

E. Long-range plans and goals of Network

"To provide the necessary planning to develop cooperative programs; to enhance graduate education and open avenues to obtain optimum utilization of faculties and other academic resources; to provide the greatest benefits to graduate students and participating institutions of the North Texas area" (LN 10)

"Increase number of member libraries" (LN 20)

"To develop and strengthen information resources and services in greater San Antonio area through the development of cooperative programs and activities) (LN 30)

"Continued improvement of collective resources in regional libraries and maximum utilization of these resources through effective cooperation" (LN 40)

"It is our desire to serve the needs of the colleges and schools within our area through a sharing of resources, both local and imported, and to develop materials which will strengthen each institution. We also hope to implement communication among the institutions and to build a cluster of services geared to the needs of each member" (LN 65)

"Expand with aid of state support (H.B. 692, 60th Legislature) to serve all of Central and South Texas institutions of higher education from Waco to the Rio Grande Valley, exclusive of those already members of SETINA or WIN" (LN 70)

"To promote the educational programs of state-supported institutions of higher education in Texas by authorizing the establishment and operation of a cooperative system for communication and information retrieval and transfer between the institutions and between the institutions and private educational institutions, industry, and the public. The system, employing two-way, closed-circuit television and other electronic communication facilities, is to provide a means of effecting the interchange of ideas, talents, faculties, libraries, and data processing equipment and a means of carrying out an approved program of instructional television" (LN 90)

F. Other comments

"Our microwave facilities could be adapted with little cost to serve library interconnection via teletype, facsimile, data transmission, or LDX or telephone" (LN 70)

"WIN will be a multi-user network and libraries will share with other users on a basis to be determined by Board of Directors. However, the broad band width of the planned network indicates little initial constraint on users" (LN 90)

II. STATE NETWORKS

A. Identification

1. Name, address, and survey code designation

   Council of State College Librarians (SN 10)
   No permanent address

   State Technical Services Institute (SN 20)
   College Station, Texas

   Texas State Library Communication Network (SN 30)
   Texas State Library, Austin

   Texas Council of Health Science Libraries, Inc. (SN 35)
   Texas Medical Association Library, Austin, Texas

   Texas Information Exchange (SN 40)
   Fondren Library, Rice University, Houston, Texas

B. Organization

1. Is Network organized on formal or informal basis?
   a. Formal
      Agreement - 1 (SN 30)
      Incorporated - 1 (SN 35)
   b. Informal
      Custom - 1 (SN 10)
      Oral agreement - 2 (SN 10 & 40)
2. Does Network have a sponsor(s)?
   a. No - 2
   b. Yes - 1
      Texas State Library under Title III, LSCA (SN 30)
3. How is Network governed?
   a. Director - 1 (SN 10)
   b. Director + Advisory Board - 2 (SN 20 & 30)
   c. Other
      Elected officers - 1 (SN 35)
      Manual of Procedure - 1 (SN 40)

4. How is Network financed?
   a. Costs absorbed by each institution without specific provision - 3 (SN 10, 20 & 40)
   b. Government grants - 2 (LSCA Title III funds cover costs billed directly to Texas State Library - SN 30). (SN 35 has received a grant, type not known)
   c. Membership and/or user fees - 1 (SN 35)

5. How is Network staffed?

   Director and secretary (SN 20)
   Interlibrary Loan staff of each participating library constitutes staff (SN 30)
   Rice University donates time of people for maintaining records and billing (SN 40)

6. Last annual operating budget

   $7,744 (SN 20)
   $47,174 (SN 30)

C. Scope

1. Who are Network participants and/or contributors?

   "All state supported senior colleges and universities in Texas" (SN 10)
   "All Texas public libraries are eligible to participate" (SN 30)
   "Medical and biological libraries, including medical schools" (SN 35)
   "Most state university libraries plus some private university libraries" (SN 40)

2. Who are consumers?

   "Same" as #1 above (SN 10, 35 & 40)
   "All patrons of public libraries in Texas are eligible to use these services" (SN 30)

3. What is the nature of the service rendered?
   a. Cooperative acquisitions - 1 (SN 10)
   b. Interlibrary loan - (All but SN 20. SN 40 states "on a one-to-one basis")
   c. Reference assistance - 2 (SN 30 & 35)
   d. Literature searches - 1 (SN 30 "to some extent")
   e. Current-awareness information and/or abstracting - 1 (SN 10)
   f. Union lists:
      Journals - 1 (SN 35 reports "in process")

4. What equipment is utilized?
    - a. Teletype - 1 (SN 40)
    - b. Telex - 1 (SN 30)
    - c. TWX - 2 (SN 10 & 40)
    - d. Telephone - 3 (SN 20, 30 & 35)

D. Growth of Network

1. Participants and/or contributors:

"Same participants but growth in all state supported senior colleges and universities in Texas" (SN 10)
"Most medium size and large public libraries are contributing as is the State Library" (SN 30)
"27 first year and 27 this year, expected to increase by about 5 during this year" (SN 40)

E. Long-range plans and goals of Network

"Facilitate co-operative and joint ventures and goals" (SN 10)

"To coordinate all State Technical Services programs at Texas A & M" (SN 20)

"Coordinate activities so that all types of libraries will participate in one coordinated Network" (SN 30)

III. REGIONAL NETWORKS - HEADQUARTERS IN TEXAS

A. Identification

1. Name, address, geographic coverage and survey code designation

Industrial Information Services, i.e. I.I.S. (RNT 10)
Southern Methodist University Science Information Center,
Dallas, Texas
"Supply service to any business firm requesting; tie-in with library/information centers out of Texas"

Regional Information & Communication Exchange, i.e. R.I.C.E.(RNT 20)
Fondren Library, Rice University, Houston, Texas
"Corups Christi, Houston, includes Lake Charles, La."

Texas MEDLARS Search Station (RNT 30)
Jesse Jones Library Building, Texas Medical Center, Houston, Texas
"Arkansas, New Mexico, Oklahoma, Louisiana, Texas"

Texas Technical Applications Network, i.e. Tex Tan (RNT 40)
State Technical Services Program, Coordinating Board, Texas College and University System, Austin, Texas
"Includes McNeese State College, Lake Charles, Louisiana"

B. Organization

1. Is Network organized on formal or informal basis?
   - a. Formal
     Agreement - 3 (RNT 10, 20 & 30)
   - b. Informal
     Oral Agreement - 1(RNT 40)
2. Does Network have a sponsor(s)?
   - a. Yes - 4
     State Technical Services Act (RNT 10 & 40)
     Rice University (RNT 20)
     M. D. Anderson Hospital & Tumor Institute; Baylor University College of Medicine; Texas Medical Center, Inc.; and the National Library of Medicine (RNT 30)
3. How is Network governed?
   - a. Director - 3 (all but RNT 10)
   - b. Director + Advisory Board - 1 (RNT 10)

4. How is Network financed?
   - a. Contributions - 2 (RNT 10 & 40)
   - b. Government grants - 3 (RNT 10 & 40 report State Technical Services Act funds. RNT 20 reports following: Special Merit Grant, U. S. Department of Commerce; State Technical Services Act; and National Science Foundation grant)
   - c. Costs absorbed by each institution without specific provision - 1 (RNT 30)
   - d. Membership and/or user fees - 3

     Annual memberships: communicating, $1,500; special, $2,500; advanced, $5,000. One-time charges: photocopying, $3; reference questions, $5; referral service, $2; literature searching, $5. (RNT 20)

     Varies with participating institution (RNT 40)

5. How is Network staffed?

   Four professional librarians and three clericals (RNT 10)
   Director, Associate Director, Technical Director; Computer Specialist, three reference librarians and three clericals (RNT 20)
   Personnel of M. D. Anderson Hospital and Baylor University College of Medicine (RNT 30)
   STS program personnel (RNT 40)

6. Last annual operating budget.

   $114,000 (RNT 10)
   $ 89,000 (RNT 20)
   $148,460 (RNT 40)

C. Scope

1. Who are Network participants and/or contributors?

   "SMU plus private corporations plus various special info centers plus IUC libraries" (RNT 10)
   "Private corporations, university libraries" (RNT 20)
   "Medical libraries" (RNT 30)
   "Participating university and college libraries" (RNT 40)

2. Who are the consumers?

   "Private corporations" (RNT 10)
   "Private corporations, university libraries, major resource center" (RNT 20)
   "Persons involved in biomedical research or related fields" (RNT [illegible])
   "Private enterprise users (business, industry, and commerce)" (RNT 40)

3. What is the nature of the service rendered?

  a. Interlibrary loan - 2
    "Loans from SMU library plus loans from IUC and RICE (via switching); location of items in other libraries" (RNT 10)
    "Standard rules except for business members for whom headquarters borrows from academic members" (RNT 20)

  b. Reference assistance - 2
    "Guidance in sources" (RNT 10)
    "Headquarters staff answers reference questions from any academic member or business user or member, questions to academic members from business are referred to headquarters" (RNT 20)

  c. Literature searches - 3
    "Normal in-house searches; switching to computer searching at TAC, DATRIX, MEDLARS, etc." (RNT 10)
    "Same" as for b. (RNT 20)
    "Limited to bibliographies and all processing done on IBM computer" (RNT 30)

  d. Current-awareness information and/or abstracting - 1
    "SDI (interest profiles) from NASA data base" (RNT 10)

  e. Other services - 1
    "Special bibliographies on special subjects of broad technical interest; teaching users re literature and information sources" (RNT 10)

4. What equipment is utilized?

  a. Teletype - 1 (RNT 10 uses IUC closed circuit facility)
  b. Telex - 1 (RNT 20)
  c. TWX - 1 (RNT 20)
  d. Telephone - 4 (All RNTs)
  e. Computer - 4
    RNT 20 & 30 report use of IBM 1401
    RNT 10 states "via outside centers 360 for mailing lists"
    IBM 1401 and 7094 used by RNT 30

D. Growth of Network

1. Participants and/or contributors:

  "SMU Libraries (1st year) to IUC libraries, TAC, Datrix, API, MEDLARS (2nd year)" (RNT 10)

  "From four to fourteen" (RNT 20)

2. Consumers:

  "Twenty-one members plus 70 users (corporations) to 36 members and 180 users" (RNT 10)

3. Financial:

   "Income $21,000 (1st year) to $38,000 (2nd year) for services rendered" (RNT 10)

4. Service rendered:

   "Six searches a month first year to 25 per month second year; documents transferred from 3,000 first year to 6,000 second year" (RNT 10)

E. Long-range plans and goals of Network

"Increase switching and service capability by (1) agreements with more out-of-state info centers; (2) use of telecommunications; (3) development of special resources; (4) training of users" (RNT 10)

"To assist in technology transfer to business and industry along the Gulf Coast; enlarge the teletype network to include other colleges, including Instituto Tecnologico in Monterrey, Mexico; to use the computer to compile a bibliographic record of regional holdings and provide direct access to the resources of participating institutions, SDI (MARC tapes and commercial tape services)" (RNT 20)

"To provide answers to problems of business and industry in Texas" (RNT 40)

F. Other comments

"The Network is in initial stage of development. The 'Knowledge Network' recently approved in principle by the Coordinating Board could provide necessary facilities" (RNT 40)

IV. REGIONAL NETWORKS - HEADQUARTERS NOT IN TEXAS

A. Identification

1. Name, address, geographic coverage and survey code designation

Bibliographical Center for Research, Rocky Mountain Region (RNNT 10)
1357 Broadway, Denver, Colorado
"Member organizations in North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Wyoming, Colorado, New Mexico, Utah, Arizona and Nevada"

Medical Library Association - Southern Regional Group (RNNT 20)
Office of the current chairman
"Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee and Texas"

Princeton University Industrial Associates (RNNT 25)
Princeton, New Jersey
"National"

Southwest Academic Library Consortium (RNNT 30)
No headquarters
"New Mexico, Texas, Oklahoma"

Southwestern Union List of Serials (RNNT 40)
The Dikewood Corporation (contracting agent)
1009 Bradbury Drive, Albuquerque, New Mexico
"The State of New Mexico and El Paso, Texas"

Technology Application Center (RNNT 50)
University of New Mexico, Albuquerque
"Primary service area is Texas and the four Southwestern Mountain states--with other 'natural resources' coverage provided nationwide"

B. Organization

1. Is Network organized on formal or informal basis ?

   a. Formal
      Agreement - 1 (RNNT 30)
      Contract - 2 (RNNT 40 & 50)
      Incorporated (Supplemented by contracts in some instances) - 1 (RNNT 10)

   b. Informal
      Charter and by-laws - 1 (RNNT 20)

2. Does Network have a sponsor(s)?

   a. No - 2 (RNNT 20 & 30)

   b. Yes - 3
      Mountain Plains Library Association (RNNT 10)
      New Mexico Library Development Council (RNNT 40)
      NASA. Network is one of six Regional Dissemination Centers under the Technology Utilization Division of NASA (RNNT 50)

3. How is Network governed?

   a. Director + Administrative Board - 1 (RNNT 10)

   b. Director + Advisory Board - 1 (RNNT 50)

   c. Other - 2
      By representatives at semi-annual meetings (RNNT 30)
      Executive committee (RNNT 20)

4. How is Network financed?

   a. Contributions - 1 (RNNT 20)

   b. Government grants - (LSCA Title III for FY-1958) - 1 (RNNT 40)

   c. Costs absorbed by each institutions without specific provision - 2 (RNNT 25 & 30)

   d. State and/or local taxes ("Some" of the financing) - 1 (RNNT 50)

   e. Membership and/or user fees - 3
      $1.00 per year (RNNT 20)

      Custom Interest Profile - $250 for 24 updates per year;
      Standard Interest Profile - $125 for 12 updates per year;
      Technical Interest Profile - $65 for 12 updates per year;
      Retrospective literature search - $125 (RNNT 50)

      Members (RNNT 10)
      Agencies covered by State-wide Support Plan: Amounts as negotiated and contracted annually, in accordance with services desired and rendered by the Center for the State Agency. Agencies covered by Direct-Support Plan: Amount to be one-fourth of one percent (.0025) of the current annual operating budget.

Non-members (RNNT 10)
Individuals: $25
Contributing supporters: $100
Sustaining supporters: $500
Patrons: $1,000

Special Fees (RNNT 10)
Per request charges for non-members: $5
Literature searches: Average hourly salary of staff performing search, plus clerical costs, plus overhead at 35%

5. How is Network staffed?

Ten FTE (RNNT 10)
Full time professional, administrative and clerical--augmented by faculty and top graduate students in technical areas and students in clerical duties (RNNT 50)
No paid staff. Elected Chairman and Secretary who serve for one year each (RNNT 30)

6. Last annual operating budget

$89,948 (RNNT 10)

C. Scope

1. Who are Network participants and/or contributors?

"Firms from the size of Texas Instruments, GE and Sandia Corp. down to little three and five-man operations" (RNNT 50)
"All types of libraries. In several states, state library agencies are contracting for service to one or more groups of libraries" (RNNT 10)
"Research libraries" (RNNT 25)
"University, college, public, medical, law, museum, military, science-technology and the State Library of New Mexico" (RNNT 40)
"College and university libraries" (RNNT 30)

2. Who are the consumers?

"Same" as #1 above (RNNT 10)
"Research libraries" (RNNT 25)
"Patrons of the cooperating libraries" (RNNT 30)
"Same" as #1 above (RNNT 40)
"Researchers, developers, degree candidates, professors (teaching aides, etc. (RNNT 50)

3. What is the nature of the service rendered?
   - a. Cooperative acquisitions - 2
     "Stated in purpose but not carried out" (RNNT 10)
     "Plans for cooperative acquisitions are being drawn" (RNNT 30)
   - b. Cooperative processing - 0
   - c. Interlibrary loan - 5
     "Extensive via verification, location and referral of interlibrary loan requests - to lending libraries" (RNNT 10)
     "As necessary to serve client's specific requests for full copy" (RNNT 50)
   - d. Reference assistance - 4 (RNNT 30 & 40 plus)
     "Subject and trade bibliographies" (RNNT 10)
     "As necessary - contact nationwide by telephone with centers of expertise in science and tech" (RNNT 50)
   - e. Literature searches - 3 (RNNT 40 plus)
     "Occasional" (RNNT 10)
     "Computer search of NASA tapes - augmented by manual coverage of other sources as necessary to be adequately responsive to need" (RNNT 50)
   - f. Current-awareness information and/or abstracting - 3 (RNNT 40 plus)
     "Title pages of current journals in limited fields sent from one member to another" (RNNT 30)
     "Same coverage as lit search - against NASA update tapes of 5000-6000 new citations/month selected from tens of thousands of potential source articles" (RNNT 50)
     (RNNT 10 reports no presently but "a future goal")
   - g. Union lists:
     Journals - 2 (RNNT 20 & 40)
       (RNNT 10 reports "project proposed")
       (RNNT 30 reports "members have exchanged lists of current journal acquisitions")

     Other materials - 0
       (RNNT 10 reports they "hope to work with union list of microfilms, microforms available in libs. of region")

4. What equipment is utilized?
    a. Teletype - 1 (RNNT 10)
    b. TWX - 4 (All but RNNT 40)
    c. Telephone - 4 (All but RNNT 20)
    d. Computer - 1 (RNNT 50 reports they use a "360/40 augmented")

D. Growth of Network

1. Participants and/or contributors
   "Began with 11 libraries; today 116 direct members" (RNNT 10)
2. Consumers
   "Expanded to cover commercial firms of all sizes - universities - local government firms and state technical services served in an eight state region" (RNNT 50)
3. Financial
   "Began with Carnegie Corporation grant of $35,000 in 1935" (RNNT 10)
   "Increasing income from fees - still subsidized by NASA and State of New Mexico" (RNNT 50)
4. Service rendered
   "Increasing spectrum from custom searches to standard profiles for selective dissemination and a strong specialization in the natural resources area - including remote sensing of earth" (RNNT 50)
5. Book and/or journal titles
   "Expanded from NASA tapes covering STAR and IAA, to include USGRDR, NSA, Engr. Index, Chem Abstracts, etc." (RNNT 50)

E. Long-range plans and goals of Network

"Not yet fully formulated. Would likely include cooperative purchasing and to some degree exclusive journal subscriptions" (RNNT 30)

"NASA's program is experimental, however regional centers are actively expanding to adapt to fill needs and potential within the region they serve. TAC aspires to and expects to earn a broader base of financial support and service spectrum throughout its region" (RNNT 50)

F. Other comments

"The network served as a basis for Type 'C' grants to many of its members during fiscal 1966-67" (RNNT 30)

V. LOCAL UNION LISTS

A. Identification

1. Name, address, geographic coverage and survey code designation

Data Processing Bibliography (LL 10)
Science & Industry Department, Dallas Public Library, and
Science Information Center, Southern Methodist University,
Dallas, Texas
"Dallas County"

A Directory of Libraries Located in Dallas County, Texas (LL 20)
Dallas, Texas
"Dallas County"

Newspaper Resources of District V: A Union List (LL 30)
University of Houston, Houston, Texas
"Houston MRC Area"

Union List of Periodicals for the Top 26 Counties of Texas (LL 40)
Mary E. Bivins Memorial Library, Amarillo, Texas
"Amarillo MRC Area"

Union List of Periodicals of Houston Major Resource Area (LL 50)
Houston Public Library, Houston, Texas
"Houston MRC Area"

Union List of Periodicals in the Larger Libraries of San Antonio (LL 60)
Our Lady of the Lake College, San Antonio, Texas
"San Antonio"

Union List of Winchell Titles (LL 70)
No headquarters
"Houston MRC Area"

B. Organization

1. Is List organized on formal or informal basis?
   - a. Formal:
     Agreement - 1 (LL 30)
   - b. Informal:
     Oral Agreement - 5 (LL 10, 20, 50, 60 & 70)
     Project of MRC Library - 1 (LL 40)

2. Does List have a sponsor(s)?
   - a. No - 2
   - b. Yes - 5
     Data Processing Management Association of Dallas (LL 10)
     Dallas County Library Association (LL 20)
     University of Houston (LL 30)
     Houston Public Library as Major Resource Center (LL 50)
     San Antonio unit of Catholic Library Association (LL 60)

3. How is List financed?
   a. Contributions - 4 (LL 10, 20, 30 & 60)
   b. Costs absorbed by each institution without specific provision - 5 (LL 10, 20, 40, 50 & 70)
   c. Subscription/sales - 2 (LL 20 & 60)

C. Scope

1. Who are participants and/or contributors?

   "Southern Methodist University Libraries, Dallas Public Library and Data Processing Management Association" (LL 10)

   "Libraries in Dallas County" (LL 20)

   "Approximately 50 public, college and special libraries in the District V area" (LL 30)

   "Public, university, college and special libraries in top twenty-six Texas counties" (LL 40)

   "Size II libraries (and Houston Public) in the Houston MRC area" (LL 50)

   "Larger libraries in San Antonio" (LL 60)

   "Public and university libraries in Houston-Beaumont area" (LL 70)

2. Who are the consumers?

   "Members of the association, interested library patrons of both libraries, other libraries nationwide" (LL 10)

   "All libraries" (LL 30)

   "Same" as #1 above (LL 20, 60, & 70)

   "Same as #1 above plus other Major Resource Libraries of Texas and State Library" (LL 40)

   "Size II and III libraries in Houston MRC area" (LL 50)

3. What is nature of the List?
   a. Books - 1 (LL 10, in field of data processing and related fields only)
   b. Periodicals - 3 (LL 40, 50 & 60)
   c. Newspapers - 1 (LL 30)
   d. Other services - 2
      (LL 20 is list of libraries and (to be) library resources in area. Will also include such information as loan regulations. LL 70 is list of Winchell holdings by libraries in area)

4. What equipment was used to produce the List?
    a. Computer - 2 (LL 10 & 70. LL 70 list stored on magnetic tape)

E. Long-range plans and goals of List

"To be a comprehensive list of all libraries, librarians and library resources in Dallas County" (LL 20)

"Keep current with frequent revisions until this method is obsolete" (LL 40)

"Statewide union list of Winchell titles (including those in supplements, as published) with future remote access by teletype" (LL 70)

VI. STATE UNION LISTS

A. Identification

1. Name, address and survey code designation

   Catalog of Genealogical Materials in Texas Libraries (SL 10)
   Texas State Library, Austin, Texas

   Catalogue of Research Facilities in Texas (SL 20)
   Texas A & M University, College Station, Texas

   The Texas List (SL 30)
   Houston, Texas

   Union Catalogue of Texana (SL 40)
   Barker Texas History Library, University of Texas, Austin

B. Organization

1. Is List organized on formal or informal basis?
   - b. Informal:
     Oral agreement - 2 (SL 30 & 40)
2. Does List have a sponsor(s)?
   - a. No - 2
   - b. Yes - 2
     Special Libraries Association, Texas Chapter, provides editorial sponsorship (SL 30)
3. How is List financed?
   - c. Subscription/sales - (SL 30)

C. Scope

1. Who are participants and/or contributors?

   Part I (Virginia) participants and/or contributors included six academic libraries, one special library, 12 public libraries, and the Texas State Library (SL 10)

   "One hundred sixty eight contributing libraries" (SL 30)

   "Libraries with sizeable Texana holdings" (SL 40)

2. Who are the consumers?

   "All types of libraries, though academic libraries lead, followed by special libraries" (SL 30)

   "Libraries and patrons interested in Texana" (SL 40)

3. What is the nature of the List?
    a. Books - 2 (SL 10 & 40)
    b. Periodicals - 1 (SL 30)
    d. Other services - 1 (SL 20)
    "A listing of research facilities in Texas"
4. What equipment was utilized to produce the List?
    c. Other - 1 (SL 30)
    "FotoList card deck, sequential camera, and standard offset press, collator and bindery equipment"

D. Growth of List

1. Participants and/or contributors

"Twenty-first contributor added for Part II (Kentucky)" (SL 10)
"1963 - 50 contributors; 1968 - 168 contributors" (SL 30)

2. Periodical titles

"1963 - 8,000; 1968 - 40,000" (SL 30)

E. Long-range plans and goals of List

"Its purpose is to provide a comprehensive list of genealogical materials in libraries of the state" (SL 10)

"1971 Edition to include all serials (estimated titles 125,000) with possible inclusion of the geographic area now covered by Southwestern Library Association" (SL 30)

VII. REGIONAL (OR NATIONAL) UNION LISTS

A. Identification

1. Name, address, geographic coverage and survey code designation

American Medical Specialty Board Bibliography Project (RL 10)
University of Arkansas Medical Center Library, Little Rock, Arkansas
"Any medical library in the U. S. may join"

Comprehensive List of Periodicals for Chemistry and Chemical Engineering (RL 20)
Ohio State University, Columbus, Ohio
"U. S. and foreign libraries"

Dissertation Abstracts (RL 25)
Ann Arbor, Michigan
"Nationwide"

Geologic Field Trip Guidebooks of North America (RL 30)
Phil Wilson, Publisher, Houston, Texas
"North America"

Masters Theses in Pure and Applied Sciences (RL 35)
Purdue University, Lafayette, Indiana
"Nationwide"

Newspapers on Microfilm (RL 40)
Union Catalog Division, Library of Congress, Washington, D. C.
"International"

Union Catalog of Presbyteriana (RL 50)
Presbyterian Historical Society, Philadelphia, Pennsylvania
"Nationwide"

Union List of Biomedical Serial Holdings in the South Central Region (RL 60)
University of Texas Medical Branch Library, Galveston, Texas
"New Mexico, Oklahoma, Arkansas, Louisiana and Texas"

Union List of Microfilms (RL 65)
Philadelphia Bibliographical Center, Philadelphia, Pennsylvania
"National"

Union List of Serials for Public Utility Librarians (RL 70)
Special Libraries Association, New York, New York
"National"

B. Organization

1. Is List organized on formal or informal basis?
   - a. Formal
     - Agreement - 2 (RL 50 & 65)
     - Contract - 1 (RL 25)
     - Other - 2
       - "Grant from the Regional Medical Program of Texas" (RL 60)
       - "Project of Public Utilities Section of SLA" (RL 70)

   b. Informal
      Oral agreement - 4 (RL 10, 30, 35 & 40)

2. Does List have a sponsor(s)?
   a. No - 3
   b. Yes - 7
      Geoscience Information Society (RL 30)
      Presbyterian Library Association (RL 50)
      Texas Council of Health Science Libraries, Inc. (RL 60)
      Philadelphia Bibliographical Center and Union Library Catalogue (RL 65)
      Union List Committee, Public Utilities Section, Special Libraries Association (RL 70)

3. How is List financed?
   a. Costs absorbed by each institution without specific provision - 3 (RL 10, 25 & 50)
   b. Government grants - 2 (RL 40 & 60)
   c. Subscription/sales - 3 (RL 20, 30 & 35)

C. Scope

1. Who are participants and/or contributors?

   "25 medical libraries in U. S." (RL 10)

   "Most graduate schools contribute their theses to University Microfilms" (RL 25)

   "Volunteer geoscience libraries in U. S. and Canada are contributors. Participants are subscribers as well" (RL 30)

   "200 different major universities" (RL 35)

   "Public, College, University and Research Libraries" (RL 40)

   "Primarily Presbyterian Library Association members--but entries included for any institutions when found" (RL 50)

   "Biomedical or health related libraries in the five state region" (RL 60)

   "Public, College, University and Research Libraries" (RL 65)

   "Public utility libraries" (RL 70)

2. Who are the consumers?

   "Hospital residents who are preparing for board examinations" (RL 10)

   "Participants and anyone who wishes to purchase" (RL 20)

"Exclusive use by graduate students, faculty, research workers" (RL 25)

"Any purchaser or user. Almost all are libraries" (RL 30)

"Same as #1 above" (RL 40)

"Any interested students or scholars" (RL 50)

"Participants and smaller hospital libraries" (RL 60)

"Same as #1 above" (RL 65)

"Any library wishing to purchase" (RL 70)

3. What is the nature of the List?
   - a. Books - 2 (RL 10 & 30. RL 60 is "contemplating book list")
   - b. Periodicals - 3 (RL 20, 60 & 70)
   - c. Other services - 6
     - Patents and monographic serials (RL 20)
     - Theses (RL 25 & 35)
     - Newspapers on microfilm (RL 40)
     - Private and corporate manuscript materials relevant to subject (RL 50)
     - Books and Manuscripts on microfilm (RL 65)
4. What equipment was utilized to produce the List?
   - a. Computer - 2 (RL 20 - IBM 350; RL 60 used IBM 7094, 1800 & 360-50)

D. Growth of List

1. Participants and/or contributors

   "Several more members have joined since the first year but exact number not known" (RL 10)

   "172 libraries in 1961 edition, 334 in latest" (RL 20)

   "Began with 93 in 1955" (RL 35)

   "24 in Texas to 33 in the five states" (RL 60)

2. Periodical titles

   "From 7,000 to over 15,000 titles (RL 60)

E. Long-range plans and goals of List

"This catalog is one stage (mss.) of a more comprehensive U. S. Presbyteriana bibliography. Other stages in various degrees of development" (RL 50)

"Provide basis for five-state biomedical information transfer system in the form of a decentralized Regional Medical Library Program" (RL 60)

F. Other comments

"Not a one volume project. Committee is working on a people network that forwards type of publication found in union list to USGS for inclusion in their Abstracts of North American Geology" (RL 30)

C.5-d

PRELIMINARY EVALUATION
TEXAS STATE LIBRARY COMMUNICATION NETWORK

By Marie Shultz

The following is a brief summary of a study currently being printed on the evaluation of the first six-months operation of the Texas State Library Communication Network, a public library Telex and telephone interlibrary loan network in Texas. Copies of the study will be distributed in July, 1969, to members of the Texas LSCA Title III Advisory Council, to public libraries in Texas serving populations over 25,000, to each of the 50 state libraries, the Texas library school collections and to the ten largest college or university collections in the state. Copies may also be borrowed from the Field Services Division, Texas State Library.

The evaluation of the first six-months operation of the Texas State Library Communication Network, July-December, 1968, is presented in two sections: the first by Peat, Marwick, Mitchell & Company and the second by the Field Services Division of the Texas State Library. The Network is funded under Title III of the federal Library Services and Construction Act, which is administered by the Field Services Division, and assistance in planning is provided by an Advisory Council representative of the various types of libraries and trustees. The Network was established as recommended in the 1967 survey commissioned by the Council and performed by Management Research International to fulfill legislative intent to foster interlibrary cooperation.

PART I

The background describes the establishment of the Network which became fully operational July 1, 1968, to serve all size Texas communities and library patrons in order to place the total resources of Network libraries at the disposal of Texas public library patrons. The

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basic Network consists of eleven Telex (Western Union teletype) stations and provides direct communication between the small, medium-sized and large public libraries. The Network is utilized when a requested title or information is not available locally; successive libraries are queried through the communication network until the request is satisfied or all sources exhausted.

The evaluation criteria were based on the goals of Section 4.0 of the State Plan for the Library Services and Construction Act for Texas, and are summarized in the following six paragraphs. The data sources to measure these criteria were: 6,900 Network Transaction Sheets (each representing a request on the Network), an evaluation questionnaire, personal interviews, unsolicited data and Texas State Library management records.

The Network cost figured in this part of the evaluation includes fixed direct costs (monthly rental on telephone and Telex equipment) and variable direct costs (telephone and Telex message charges) which totaled $7,666. Average direct cost per transaction was $1.60. It is estimated that direct costs per transaction will decrease with increased volume on the Network.

Improved interlibrary cooperation was determined by an increasing trend in transaction volume and by favorable participant reaction. The number of transactions, while related to fluctuations of library circulation, showed an overall increase through elapsed time. Questionnaire consensus rates present ability of the Network to foster interlibrary cooperation as "good" with "excellent" potential. Eight of eighteen unsolicited letters stated directly or indirectly that the Network was fostering interlibrary cooperation.

Questionnaire consensus indicated three days as a reasonable period within which to complete an interlibrary loan request; in an average Size I library more than 70% of interlibrary loans were completed in this period while the average time for more than 90% of all requests completed by Size II libraries is three days or less. The

Texas State Library Reference Division completed more than 80% of all requests in three days or less. Accelerated processing of interlibrary loans was not accomplished when a request was referred on to MRC libraries by the Reference Division. (50% of all such requests were completed in three days or less at the beginning of the survey period, but time for 50% increased to 10½ days or less by the end of the survey period.)

Improved patron satisfaction was measured by favorable reaction of Network participants, favorable unsolicited comments and ratio of referrals to population served. The consensus of questionnaire response indicated present ability as "good" with "excellent" potential; seven of the unsolicited letters mentioned patrons were pleased and there were no unfavorable comments on this point. Analysis of use showed wide variation in the volume of Network interlibrary loan activity to population (computed as the annualized number of completed referrals by each Size I library divided by the population served [in thousands]). While patrons served were generally pleased it is unknown what effect this service had on the general public.

Available data were not adequate to directly measure adequacy of basic collections but data were summarized to show the number of interlibrary loan requests filled (San Antonio filled the most); libraries which filled more than they requested; and libraries which requested more than they filled. The consensus of questionnaire responses indicated current ability to identify collection weaknesses as "good" with "excellent" potential. Libraries can draw evaluative conclusions about their collections using the filled and unfilled requests handled locally.

Characteristics of Network use show that the majority of requests do come through the telephone and Telex system (although a significant amount still were mailed), that the requests were for adult nonfiction (as intended), and the majority of the requests were for a specific title rather than requests for information or answers to reference questions. Because the patron status was the most frequently missing entry on the

Transaction Sheet no positive conclusions can be made about the type of patron the Network was serving.

Peat, Marwick, Mitchell and Company's recommendations for improvement included: formulation of an operating plan to contain cost objectives, desired levels of participation and desired time to complete a referral. After development of the operating plan the action program should be developed to contain definitions of what has to be done, who will do it, when it will be begun and when it will be completed. Control procedures should be established to provide Telex management with follow-up on specific unfilled requests and status reporting of all unfilled requests. (The major complaint expressed by participants was ignorance of request status.) The facilitate data collection and reporting the Transaction Sheet should be redesigned and simplified with consideration given to multi-part forms (allowing a suspense and patron file), multi-purpose forms (for internal data collection and Network evaluation) and electronic data processing for accurate, timely and economical tabulation. Transaction sheets should be forwarded monthly to Texas State Library for interim auditing and data correction. Evaluation should be made at six-month intervals.

Data evaluated and summarized is presented in exhibits, charts and graphs at the end of the report.

PART II

For benefit of those interested in more detailed understanding of the Network operation, the Field Services Division prepared additional conclusions and further calculations of the data gathered for this evaluation.

During the evaluation period, of the 354 Texas public libraries 250 used the service, 36 only once, 117 between two and ten times, eleven more than 100 times. Lubbock placed the largest number of requests (253). While wide variation in frequency of use is noted Network use has increased and a larger number of public libraries are making use of the service.

The quality of the transaction sheets also demonstrated extreme variation. The Major Resource Centers include Abilene (excellent and complete sheets reflecting 211 title, nine subject requests), Amarillo (very fine sheets showing 202 title, 47 subject requests), Austin (213 title, 17 subject, two reference requests--submitted usually on ALA forms), Corpus Christi (adequate sheets for 532 title, 86 subject, 44 reference requests), Dallas (very good sheets for 196 title, 12 reference requests), El Paso (various forms submitted for 309 title, 65 subject, one reference, two microfilm requests), Fort Worth (very good sheets indicating 305 title, 28 subject, three reference requests), Houston (usable sheets reflected 643 title, 65 subject, 32 reference requests), Lubbock (marginal forms reflected 67 title, five subject requests), and San Antonio (excellent sheets showing 1,154 title, 201 subject requests on a wide range of subjects). Thirty-eight Size II libraries serve as intermediate points in the Network, too many function only as referral points to the MRCs, but most were very prompt in either filling or referring requests. Transaction sheets were either excellent (Arlington, Baytown, Brownwood, Conroe, Denison, Haltom City, Longview, etc.) or practically unusable with no middle area.

General evaluations disclose the majority of requests were for adult non-fiction; several units gave true in-depth service; primary complaints concern length of time to fill requests referred from State Library and lack of status information, increased time to process a request, need for more complete request information, need for more prompt MRC response to Texas State Library queries, need for better bibliographic verification, need for more Texas State Library personnel, more clarity and fullness in transaction sheet completion, more judgment in weeding and referring requests; and the Network, while not necessarily speeding requests, has definitely broadened sources for filling requests and has promoted interlibrary cooperation.

Plans for better future evaluation of the Network will be aided if the following recommendations are implemented: monthly reports and

Transaction Sheets should tally, Transaction Sheets should be accurate and complete, more of the public libraries should use the Network, administrators should find opportunities to become more involved and monitor Network operation.

While the fixed and variable communication costs total an average of $1.60 per transaction, a more complete consideration of communication plus supplies, personnel and postage brings the average cost per request to a more realistic figure of $5.98 for the 5,000 filled requests evaluated in the study.

The period July-December, 1969, will constitute the second period for evaluation of the Network. The second study will be done by the Field Services Division in early 1970.

C.5-e

REFERENCE LIBRARIANS AND NETWORKS
HOUSTON CASE STUDY OF LSCA, TITLE III SPECIAL PROJECT

By Richard O'Keeffe

You are well aware that Title III of the LSCA has to do with interlibrary cooperation; funds may be used to establish and maintain cooperative networks of libraries for the systematic and effective coordination of the resources of academic, public and school and special libraries as well as information centers in pursuit of the goals and purposes of the Act. In fact, my understanding is that to be approved for funding under this title a state must have a plan for this type of coordination of resources. The Texas State Library has such a plan and encourages such cooperation as a matter of policy.

The Fondren Library at Rice University, which serves as the headquarters for a group of academic libraries working together and serving business, commerce and industry, made a successful proposal to the Field Services Division of the Texas State Library (as headquarters of a Major Resource Center Library). We noted that, since many of the goals and purposes of the State Library network and the R.I.C.E. are the same or similar, there was good reason to experiment with ways in which such operations can work together.

The Information Exchange organizes the resources of seventeen Gulf Coast academic libraries between Lake Charles, Louisiana and Brownsville for the purpose of supporting higher education and research and in order to focus college and university library resources on the needs of business and industry on a regional basis. A computer system is maintained at headquarters for operational and developmental uses, and teletype (TWX and Telex) communications is supported in all academic libraries for interlibrary loan and other purposes. A full-time professional and technical staff works at the headquarters level to develop and coordinate the work and progress of all Exchange activities and proposals.

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*Mr. O'Keeffe is Librarian and Project Director, Rice University, Houston, Texas.

In the larger academic libraries of the Exchange (University of Houston, Rice University, and Texas A & M University, for example) there are both general and special bibliographic, reference, and subject literature resources that should be of immediate interest and assistance to patrons and users of all the libraries in the counties covered by the Houston MRC. Many of these resources are things the State Library, to day nothing of the MRC libraries, should not have to purchase, catalog, house and service so long as it has controlled and effective access to them.

And, so, we have modest funding for a year's experimentation with the Houston Public Library. We stress the experimental aspect of this operation, for unless we can conclude on both sides of the experiment that such diverse library and technical information services can be worked together in ways that the complete public library network in Texas might take appropriate advantage. There are, after all, strong academic and public libraries throughout the state.

In order to keep records of all transactions and to be able to promote services; note the source of inquiries; measure the impact of our services, etc., we have it arranged that all inquires come through one service point in the Houston Public Library (usually through one and the same person, Miss Andrea Edwards) to one service point and person at Rice (usually Mrs. Rita Paddock). All of the services of the Exchange, except only searching of the technical literature, are available; that is, we will attempt to answer reference questions, identify and verify materials and sources of information, locate needed materials, refer inquirers to more likely sources of help, lend library materials to other libraries for the use of their patrons under the terms of the Interlibrary Loan Code, arrange for photocopies of library materials that cannot be loaned, etc. We are paid for the half-time of a clerical assistant and are compensated according to a schedule of charges for these services.

The Houston Public Library is responsible for analyzing and screening requests coming in over its own Reference Desks and from the

Size II libraries to determine what should be switched to us. We encourage the Houston Public Library, of course, to tell us as much as they can about the status of the inquirer (student, businessman, etc.) and to give us the opportunity, as required, to get in touch directly with him. Records are maintained at the H.P.L. and we are benefiting from going down there at quarterly reporting times to examine with them the questions that were submitted; the way we handled them; how well or poorly we performed; the personal and/or communication failures that can and should be eliminated in subsequent dealings.

We are attempting through specially prepared and widely distributed leaflets to make this service known. We were guests at a February, 1969 meeting in Orange of librarians of Size II libraries to discuss this experiment and to answer questions and criticisms. If I am convinced of anything so far in the brief history of this experiment, it is to take nothing for granted. As well as we and the area public librarians have known each other, it was necessary to hammer out a new relationship in this program. Even great and strong resources are not necessarily interpreted to others without pain and effort. Confidence and mutual trust and respect must be established; we must not give the false impression of doing a better job than other librarians, but back them up with our special strengths and experience. In this context, the series of seminars being held at the University of Houston in cooperation with the Texas Chapter of the Special Libraries Association are helpful to all of us in the Greater Houston area in terms of promoting better understanding among libraries concerning resources, special and common problems, and the present level and success of library interaction. In developing a plan for effective cooperative effort that will develop total library resources without interfering with anyone's primary responsibilities, we can hope to contribute to the success of the special project I have described today.

C.5-f

A PILOT MODEL OF INTERLIBRARY COOPERATION IN THE DALLAS AREA - PROGRESS REPORT

By Maryann Duggan

(Note: This paper is reproduced here as presented during the Reference Round Table meeting with the exception of the appendices and data. That part of the Pilot Model is presented in detail in Section IV of this final report. The ideas and methodology proposed in the attached paper were further developed into LibNAT, which is presented in detail in Section VI of this final report.)

I. INTRODUCTION

In November 1968 the Texas State Library Advisory Council for LSCA Title III recommended that the 1968/69 State Plan include an in-depth study of interlibrary cooperation in a metropolitan area. This study was needed to assist in future planning of statewide interlibrary networks to improve the sharing of resources and services among different types of libraries, as required under Title III.

As Director of SMU's Industrial Information Services program, I had been concerned over the past two years with the complexity of interfacing different types of libraries in an orderly manner. Also, through an extensive current project known as Goals for Dallas Libraries, we in Dallas were acutely conscious of the interdependency of the various types of libraries in a metropolitan area. We were also acutely aware of the difficulties and barriers to interlibrary cooperation. The Goals for Dallas Libraries project had qualitatively identified possible means for improving library services in the community but had not provided any factual-quantitative data on the interlibrary dynamics in the community. Thus, we at SMU eagerly submitted a proposal to the State Library to run a pilot model in the Dallas area to

1. Quantitatively determine parameters and characteristics of existing interlibrary cooperation; and
2. Determine the "best way" to improve and enhance future interlibrary cooperation for purpose of maximizing some functions.

The proposed Pilot Model project included several phases, namely:

Phase I - Observation of existing practices
Phase II - Analysis and interpretation of existing practices
Phase III - Modification of the system according to plan designed to enhance interlibrary cooperation
Phase IV - Observation of practices under new conditions
Phase V - Interpretation and recommendations.

We are now finishing Phase I and entering Phases II and III. The following is a brief summary of our experiences and findings as of March 14, 1969.

II. PROCEDURES

The first step was to identify participating libraries and to seek their cooperation in joining in the Pilot Model. Libraries of various types and sizes were selected with the intent that the participants be representative of the types of libraries and the situation across the state. For example, we wanted participants who were and were not members of various statewide networks. The following types and number of libraries were invited to participate:

Description	Number
Public School, Elementary	2 systems
Public School, Secondary	2 systems
Junior College, Public	1 system
Private University, Large and Departmentalized	1
Private University, Small	1
State University, Large and Non-Departmentalized	1
Medical School	1
Private Research Institute	1
Industrial Library, Large	2
Industrial Library, Small	1
Public City Library, Large	1 system
Public City Library, Small	2 systems
Public County Library	1 system
Switching Center	1

All of the above except one public school system agreed to participate on initial contact in January 1969. As of March 14, data have been received from all the active participants. As of March 11, the second public school system agreed to a sampling of data from three of the libraries in the system; this sampling will be done during early April.

The second step was to determine what data would be indicative of the existing, on-going interlibrary cooperation among the participants and between the participants and the "outside world." Recognizing that interlibrary cooperation should include many functions such as cooperative acquisitions, cooperative cataloging, cooperative reference services, cooperative storage, etc., it was decided to limit Phase I to a study of interlibrary loan transactions. This one characteristic of interlibrary cooperation could be quantitatively measured. Furthermore, the Texas State Library was seeking information on how to improve the interlibrary loan network sponsored under LSCA Title III. Thus, data on interlibrary loan transactions from each participant were collected for a 30 day period. Those libraries maintaining past records submitted their data for October 1968; the remaining participating libraries collected data for the period most convenient to them, such as January 15-February 15, 1969, etc. Each library submitted data for their borrowing and their lending transactions for the sampling period. The variables included were:

1. Date of transaction
2. Name of borrowing or lending library
3. Location of borrowing or lending library
4. Type of borrowing or lending library
5. Format of request message, i.e. phone, ILL form, TWX, Telex, IUC, letter, other
6. Nature of the requested item, i.e. serial, monograph, journal, document, other
7. If item available, how supplied, i.e. loan, photocopy, microform, other
8. If item not available, why not, i.e. not in collection, in use, non-circulating, other.

9. Time lag from date of request to date of completion of the transaction.

Daily Lending and Daily Borrowing Record Forms and the Monthly Lending and Monthly Borrowing Forms were developed.

Step Three was to collect the data on these forms and to code each transaction for computer processing for the analysis phase. The codes for each variable were developed. The Southwest Center for Advanced Studies donated to the project the necessary data processing skill and computer time.

III. DATA ANALYSIS AND INTERPRETATION METHODOLOGY

We are presently engaged in this phase of the Pilot Model. It became obvious that a large number of variables can be examined from the data collected. Many things can be learned about the interlibrary dynamics and interdependency from these data. For example, the following characteristics of the "network performance" could be examined:

1. Input/output analysis for each node and total network
2. Borrowing/Lending ratio for each node and total network
3. Interaction among various types of libraries as a function of
    a. Geographic location
    b. Type of item
    c. Format of request, i.e. channel availability
4. Relative "success" in filling transactions as a function of
    a. Type of library
    b. Type of item, i.e. locator guides
5. Relative volume of "local switching" compared to switching at other geographic levels (and reasons why)
6. Relative relationship between a node and the total network, as a function of type of library, channel availability, utility, etc.

Basic decisions have to be made as to which of the possible factors are the most significant in understanding interlibrary transactions and in generalizing from the pilot model to the design of a statewide interlibrary network. The conceptual framework necessary for understanding the pilot model data is being developed and is presented here for your evaluation.

1. Each participating library can be categorized as a given type and at a given geographic level. Therefore, each transaction among the participating libraries and between the participating libraries and the "outside world" can be categorized as to (a) type of library, (b) geographic location, and (c) direction of flow. Thus, each transaction can be symbolized by a "reaction formula" and the total transactions in the network so summed by transaction formula.

2. Each participating library has Borrowing Transactions and Lending Transactions. The relative number of B to L and the actual number of total transactions is significant in identifying the role of that library in the network and the total level of network activity. Specialization of roles becomes apparent.

3. The relative effectiveness of the network can be evaluated based on "success" and "request/hit ratios" and turnaround time and costs. Possible reasons for existing conditions can be examined and thereby possible methods of enhancing transactions success identified. The quantity of "utility" can be examined.

4. The integral components of an interlibrary document transfer system can be identified and their relative contributions evaluated. The decision-making mode of the network operations can be reviewed quantitatively when all alternates are known.

5. The configurations (geographic, organizational, functional and systematic) can be identified and evaluated.

6. The factors of selectivity as to which requests are submitted to the network are important considerations. Policy as to "levels of service" by patron group needs clear definition as networks become more complex. Fixed policy vs. variable policy may present conflicts. Node policy vs. network policy might be another area of conflict. The ideal combination of policy ingredients will be illustrated this afternoon with our networking games.

7. The applicability of known theories to interlibrary dynamics can be reviewed. Possible applicable theories include:

General Systems Theory
Information Theory
Decision Theory

Theory of the Firm
Sets and Group Theory
Game Theory
Organizational Theory
Queueing Theory
Network Theory
Graph Theory

8. In like manner, the applicability of known problem-solving strategies can be reviewed. Possible applicable strategies include

Operations Research
Decisions Under Uncertainty
Allocation Algorithm
Modeling and Simulation
Input/Output Analysis
Break-Even Analysis
Benefit/Cost Ratios

In other words, the microscopic study of the interlibrary dynamics in the Dallas Pilot Model has given new insight and understanding. It has stimulated the formulation of "a way of looking at networks" which we believe is applicable to library networks in general. We are no engaged in an in-depth analysis of the pilot model data within these and other conceptual frameworks.

IV. PRELIMINARY RESULTS

The following quantitative data have been collected to date:

1.	Number of Active Participants	19
2.	Number of Total Transactions (B+L)	1967
3.	Number of Filled Borrowing Transactions	657
4.	Number of Filled Lending Transactions	867
5.	Total Number Filled (3+4)	1524
6.	Total Number Unfilled (2-5)	443 (i.e. 23%)

V. THE FUTURE: SEEKING METHODOLOGY

The Pilot Model will be continued until June 30th. One more month of existing interlibrary transactions is being collected. At I.I.S., we plan to install a TWX/Telex interface to tie together the public library and the academic library networks and observe the resulting problems. Every effort will be made to encourage local switching to determine the capability of the metropolitan area to supply its own library needs from the resources within the area. Two months of interlibrary transactions will be collected after the TWX/Telex interface is operational. Barriers to local switching will be identified. Criteria for "going on the network" will be observed and identified. The search for a "generalized network theory" and appropriate methodology will continue. The mathematical model described by Dr. Nance this afternoon will be used for experimental simulation and possible evaluation of various alternate network configurations, both geographic and functional. The reasons for the relatively high number of uncompleted transactions will be reviewed and possible solutions proposed and evaluated.

The final report of the Pilot Model is due July 1, 1969. We do not know, at this time, the final results of this study. We are sincerely seeking insight into the interlibrary network relations and systems, and ways to enhance these relations. Possibly a new technology--Informetics--may emerge. We welcome advice and guidance--our philosophy must be: The depth of man's questioning is far more important than the answers.

VII. ACKNOWLEDGMENT

This work would not have been possible without the patience, understanding and encouragement of many, particularly

Marie Shultz
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Janice Kee
Jim Stephens and his staff
The good people on I.I.S. staff
SMU administration
Ross Peavey and Carl Peters at SCAS

All the enthusiastic participants who donated their time and data
Those of you who have faith that "the truth shall set you free."

C.5-g

STRANGLE THE MACHINE, I CAN'T HEAR MYSELF THINK!

By Margaret F. Morris

When I was asked to speak on the general subject of living with a communications network, I was startled but enthusiastic. Invitations to "read a paper" rarely filter down to the working level of academic librarianship. Heads of divisions, library directors, and system coordinators usually know more about the subject, are more experienced, and exude a greater air of confidence and lofty wisdom. But division heads and library directors do not share an office with a teletype--although I understand that this is the case at the Library of Congress. Certainly they do not contend with garbled transmissions, nonexistent articles, and journals that change titles with the moon. If you want to know what really happens at the business end of a telecommunications system, you must ask the girl who owns one.

The University of Texas at Arlington is a member of two networks. The Inter-University Council (or IUC) system is a private-line operation connecting eight colleges and universities in that Cambridge of North Texas, the Ft. Worth-Dallas-Denton area. Texas Information Exchange (or TIE) is made up of all state-supported colleges and their medical, legal, and dental appendages. It interfaces with the Regional Information and Communication Exchange--known in the trade as RICE and frequently confused with Rice University--through Houston. Arlington serves as the relay or switching center, between IUC private schools and TIE. We have two machines, the 60 wpm private line and the 100 wpm TWX.

Telecommunications belong to interlibrary loan, itself an offshoot of the Reference Department. Two librarians, one clerk and five 15-hour-a-week students staff Reference. While certain ones are "assigned" to interlibrary loan, somehow we all get involved. We handle all ILL requests initiated on our campus and those received from other libraries. Our clerk and students have been trained to verify in national bibliographies and union lists, and handle all routine matters. Problems go

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*Miss Morris is Reference Librarian, University of Texas at Arlington.

to Maxine, our clerk, and real horrors end up with one of the librarians. The clerk and students handle all materials physically--locating books, charging them, wrapping and mailing, typing request forms, sending teletype messages, receiving and recording material, making copy, and typing invoices. Photocopying is done by our Audio-Visual department which has custody of the Xerox and reader-printer. We loan all microforms. During a rush, or when illness or vacations cut the staff, the librarians can, and do, take care of everything. In addition, one of the librarians works closely with faculty members and graduate students embarking on lengthy projects. The more we know about a project, the better service we can give. This has included corresponding with foreign, private, or shy libraries, making special arrangements to open private collections, and so on. It keeps us off the streets. To give you an idea of what goes on, we logged one Monday in November during an average period. The names have been changed--to protect me from the wrath of some present. I was about to quote "Dragnet" on changing names but somehow, the word "innocent" does not fit in any discussion of communications networks.

As I unlocked the workroom, the TWX began to clatter out a five-item photocopy request from Tech. Softly cursing the early bird out in what Paul Crume calls "the high baldies", I looked for a student. One was trying to sort out the mess left in the reference room by Sunday night's last-minute Charlies. Tech's need being greater than Britannica's, she pattered off to check the serials catalog, corner the journals, and induce A/V to copy them.. Our clerk staggered in with a stack of ILL books turned into Circulation over the weekend, all needing to be sent home. At 8:30, we received an indignant query from TCU about the non-arrival of material from Houston, and were we sure we relayed the request last Tuesday? I fled to my own office next door and was greeted by a graduate student on the verge of hysteria. Late Sunday night, he discovered a citation to that well-known classic work, "Incidence of Tooth-Decay in Fossil Shark's Teeth of the Bohemian Tertiary Chark", by by Tyrannosaurus Bedrock. Copy was needed ten minutes ago, and please, how does he fill out the request form? My student called down from Periodicals. One of Tech's citations didn't fit the journal. It was Monday, all right. Meanwhile our clerk reassured TCU, cut a tape, and sent four requests to Rice. She called a faculty member to remind him to return a book, and departed for the Bibliographic Center to commune with the Union List about some requests turned in at 4:57 Friday afternoon. The brownies hadn't verified them over the week end after all. At 9:00, I went down to the information desk, ready for a reasonable hour of showing students how to use the subject catalog, answering the phone, and directing lost souls to the water fountain.

In this same hour, our clerk verified several titles, cut the tapes, and sent requests to libraries said to own them. We would later discover that one library had never heard of the learned journal of which it was alleged to possess a full run. Hence the phrase, "to lie like a union list." She then read the teletype carbons from Friday and Saturday, recorded copy sent and received, and double checked that we had answered all messages. We had missed one. East Texas was, she hoped still patiently awaiting an answer to a request they sent to us Friday morning. She knew they were waiting, but how patiently she dared not guess. When a short message comes in just below another short one, it can be over-looked, especially if the office is empty when it comes in. We manage this at least twice a month. We are embarrassed and very apologetic, but it still happens.

At 10:00, I fled for coffee. When I got back, all was quiet. Maxine was caught up, the eternal statistics were posted, out-going mail was ready, and the machines were asleep. You understand, this cannot last. Enter stage left, our mail boy with the week-end first class. Maxine went to work on her share, an assortment of requests, notices of return, replies to our requests, and, joy forever unconfined, a check from NASA for $6.90. I had a note from the English department about securing copy of reviews of a very obscure novel published about 1902 in even more obscure newspapers, all of which seemed to have died shortly after the first World War. As the learned gentleman has never figured out how to get the requisite information on one of our request forms, I transcribed the information and checked Newspapers on Microfilm. Ordering hard copy from some places would require letters, so I drafted one and left it for Maxine to type later. Then I checked the problem from Lubbock in the Engineering Index and discovered that the date and volume numbers had been victim of a gremlin in transmission. No student was available and Maxine was up to her ears in the mail, so I located the article and took it to be copied. For a blessed forty-five minutes I could get on with something else.

At 11:15, our friendly mail boy returned . . . seven envelopes of copy and twelve packages. Maxine looked at them with some resignation and went to lunch. As both teletypes started to clatter, the telephone rang. A faculty member wanted to know if his book had come from Berkeley. I told him I would check the package mail and call back.

There are few things we loathe more that what I call "the moulting jiffy bag". You all know the familiar padded bag. The things are advertised as safe, convenient, and time-saving. When describing a new bag only slightly larger than the book inside, this is true. But when a small, sharp-cornered book is shoved into a used jiffy bag which would easily accommodate two volumes of the Oxford English Dictionary, the corners rip the inside of the bag as the parcel bounds through the mail. If you have never seen the end result, I offer in evidence Exhibit A. The plastic wrap was supplied in self-defense by the post office. This unfortunate once contained a fat book and a skinny one, unwrapped, unpadded, and unsung. Ten cubic feet of shredded fluff lurk within waiting to burst out if the little horror is opened injudiciously. Even when all precautions are taken--don apron, remove staples gently, hold breath, and STAND WELL BACK--you are likely to be showered with jiffy bag stuffing. Our students, being young and agile, manage to come out of the conflict clean. Maxine has elevated opening jiffy bags to the status of an art form. I get jiffy bag innards all over me. I checked in the book from Berkeley, called the faculty member, and congratulated myself for two hours on my restraint when he asked, "It wasn't any trouble, was it?" He should have heard the janitor.

When Maxine returned from lunch, she spent forty-five minutes opening the package mail and checking it in. All kinds of satanically-contrived statistics have to be kept on this sort of thing--date received, postage, insurance, date due, and so forth. Several books were ours. She cleared her records and returned the books to Circulation. Notices were phoned or mailed to patrons whose books or copy had come in, invoices on copy filed, and those to be charged to on-campus accounts put aside for vouchers. Then a request from the University of Oklahoma Medical School sent her up to periodicals. One normal transactions of this sort takes about ten minutes. If the volume is not on the shelf or something is wrong with the citation, it takes longer. Sometimes much longer.

During the rest of the afternoon, she ran down six requests from the University of Houston, Texas at Austin, and Prairie View and sent them to be copied; spent twenty minutes looking for our copy of the Texas List; and worked a telephoned "urgent" request from LTV. Another twenty minutes was invested in trying to get out on our switch board and in on LTV's. Around 3:30, she rechecked the tear sheets before asking North Texas for a report on a request she sent them the preceding Wednesday. North Texas replied that they not gotten the request and assumed it to be floating around in the ozone somewhere. But they would check on the requests (which she had repeated), and call us back. Oh, and by the way, was it sleeting in Arlington? She also forwarded a student with a problem to me.

Margaret was hurt. As my senior student assistant, a graduating senior English major, and candidate for admission to library school, she was crushed that she was unable to verify a simple American imprint. The faculty member making the request was trustworthy in his citations, the request was legible, the citation made sense (not like one of our more infamous examples, "Alfred A. Knopf, 1835"), and LC had never heard of it. She had verified an earlier edition in the British Museum catalog, and both BIP and CBI listed paperback abridgements. I retired to the Bibliographic Center and made a great discovery. The 12th century agricultural writer, Walter of Henley, is cited in major bibliographies as "Walter of Henley". Writers on English medieval history from Bishop Stubbs to Sidney Painter call him "Walter of Henley". I call him Walter of Henley. But not the Library of Congress. In their hallowed halls, he is known as "Henley, Walter of". I verified him and sent him to Austin. I still don't know how they enter him. Probably as "of Henley, Walter".

The "south campus" must have thought we had it in for them that day. Walter was followed by a seven item relay from SMU, all in what appeared to be the German equivalent of IEEE. It took fifteen minutes just to cut the tape. At 4:30, Maxine assembled the insured and first class mail, sent for a boy to carry it down to her car, tucked the stamp envelope into her purse, and departed. The stamps were in case our scales hadn't agreed with those at the post office. They frequently don't.

We do not have a postal substation on campus. Nothing can be insured or registered without a trip downtown, and for reasons that those of you associated with state institutions can guess, we do not have a blanket insurance policy. New postal employees have never heard of "library rate", so we keep a Xerox copy of the appropriate page of the Postal Manual with the stamps. We recommend this to anyone with similar problems.

It must seem that we are so disorganized that it's some kind of miracle that we ever get anything done. Were it not for an interested clerk and intelligent student assistants, we wouldn't. The first requirement for making a telecommunication system work is good clerical help.

Your clerk must like and understand the work, be able to deal tactfully with the faculty and sympathetically with graduate students, understand the use of all sorts of locators and verification tools, and have that sixth sense for locating weird items. Hers is the day-to-day administration of a Chinese fire drill . . . six or eight people running around in an aboriginal folk dance to the music of two teletypes with occasional telephone chords. Days have gone by with nothing unusual happening. Then there are the others . . . when the TWX intercepts twelve lines of five-letter code groups intended for a local aerospace plant, when the private line "runs open", making noises like a demented typewriter, or when an electrical storm upsets both of them at the same time and the lights go out. There are days when every member of the faculty first dismisses his classes to "work in the library", then drops by or calls; when a request gets so garbled in transmission that you can't tell who sent it, much less what they wanted; when labels get switched in someone's mailing room and you receive a mysterious book you know you don't want; or when an item clearly cited in a reliable standard bibliography seems to have vanished from human ken. Keeping statistics is a complicated, exacting chore, moulting jiffy bags cover the workroom with dreadful-looking grey fluff that makes everybody sneeze, the Xerox breaks down too late in the day to get the service man--you know, 9:00 on Tuesday morning and the mail is slow.

Bennett Cerf used to ask on "What's My Line", "Do you deal in a service?" Yes, we do. The requests are handled faster than they ever were. Information gets to the people who need it with, believe it or not, a minimum of fuss and feathers. And that is the name of the game. We deal in a service and telecommunications networks improve that service. We know what photocopy will cost, the billing is handled centrally, and though our volume has increased 200% in the last two years, our service is much better. And there is one other benefit. The librarians running it collect a lot of good stories.

APPENDIX

The following log was kept by staff members actually involved in all forms of interlibrary loan work for two days, November 26 and 27, 1968. It has been transcribed exactly as entered. It does not claim complete accuracy. As may be noted, many separate operations were logged together with a single block. We tried logging each part of a transaction (or operation), i.e., checking the catalog, X minutes; locating the material, Y minutes; and so on; but found it too much trouble to carry the clipboard and stopwatch around. Despite this deficiency, I believe the log gives a fairly accurate picture of two days of operations of a "multi-circuit" (mail, telephone, teletype) network.

CAST

MFM	Your humble servant, Reference Librarian
MYB	Reference and Interlibrary Loan Clerk
MMS	Senior student assistant, Reference and ILL
KKH	Student assistant, Reference and ILL

ABBREVIATIONS

RQ	Request
ILLRQ	Interlibrary Loan Request (distinct from photocopy)
P'copy	Photocopy
msg.	Message
NIL	Not in library collection
NOS	Not on shelf
Jl.	Journal. Used for all serial publications shelved in Periodicals
SC	Serials Catalog
PC	Public Catalog
SL	Shelf List
Bib. Cen.	Bibliographic Center. Contains Union Lists, national catalogs, and other bibliographic tools and locators
IIS	Industrial Information Services

In almost all cases, NUC symbols are used to identify requesting and supplying libraries.

Appendix, p. 2

TIME STUDY, INTERLIBRARY LOANS

26 Nov. 1968

Initials	Operation	Time
MYB	Checked tear sheet from yesterday	5.40 min.
MFM	Checked RW from SMU, NOS, replied	5.40
MFM	Adjusted paper and straightened carbon paper on TWX	4.78
MYB	Neg. reply from TCU on ILLRQ sent yesterday, checked previous places requested and sent to TWU	5.00
MYB	Bookkeeping on ILLRQ, posted statistics	12.10
MYB	Relayed msg. to TxDaM from TxHU	3.49
MYB	Received 2 ILLRQ from SMU, checked PC. 1 NIL; went to 3d floor for other, NOS. Checked Circulation records, noted due date, sent report to SMU	16.77
MYB	Rec'd ans. to TxHU relay from SMU, made tape and sent to TxHU	4.79
MYB	Sent ILLRQ to TxHU	3.00
MYB	3 books returned in mail. Unwrapped, cleared my records, returned to Circulation and discharged	9.69
MYB	ILLRQ from IIS. Checked SC, got jls. on 5 and took to 6 for copy, answered msg.	10.80
MYB	Sent 3 ILLRQ to SMU	2.10
KKH	Verified 4 RQ from faculty member, couldn't find 1. Gave 3 to Mrs. B. and 1 to Miss M.	20.47
MYB	P'copy RQ from TxHU. Checked SC, located jl. and took for copy. Picked up copy made earlier, entered copy on book and prepared for mail, sent reply to TxHU	12.78
MYB	Answered msg from IIS	3.20
MFM	Took RQ Karen couldn't find. Citation looked funny, rechecked source. Bad citation. Called patron to reverify what he wanted. He will resubmit.	15.60

Appendix, p. 3

TIME STUDY, INTERLIBRARY LOANS (contd.)

Initials	Operation	Time
MYB	P'copy req. from TxLT. Checked SC, found jls. and took to 6 for copy. Picked up earlier copy for TxHU. Answered TxLT, did bookkeeping on copy and prepared for mail	13.20
MYB	ILL forms in mail from TI, Baylor, and OU Med. School. Checked PC, sent student to collect. 1 NOS, not checked out. Asked Circulation to search. Charged books and posted records. Marked forms for return	15.68
MYB	P'copy RQ from TxPRC. Checked SC, went to 5 Jl. NOS. Searched, asked Periodicals to continue search	20.78
MYB	5 P'copy requests submitted, tried to verify and locate, couldn't find Texas List. Hunted, finally found on top of PC. Verified and sent RQs on TWX	25.46
MYB	Picked up copy of TxLT, returned jls. to 5. Posted copy in record book and prepared for mail	11.20
MYB	Checked yesterday's tear sheets and today's to see if NTSU had answered RQ. Asked for report	2.10
MYB	Wrapped, weighted, and otherwise prepared for mail 3 packages	20.20
MYB	Typed 4 ILLRQ forms, filed orange copies	5.73
27 Nov. 1968		
MYB	Checked tear sheets from both machines, did statistics	15.80 min.
MYB	Sent long relay to TxDaM from TxNACS. Rec'd copy from TWU, posted it and sent to patron in campus mail	20.82
MYB	ILLRQ from TxCOMT. Checked PC, got book and charged; sent report to TxCOMT	12.50
MYB	Call from patron asking for renewal; called another patron with a status report on his RQs	8.47

Appendix, p. 4

TIME STUDY, INTERLIBRARY LOANS (contd.)

Initials	Operation	Time
MMS	Requested renewal from SMU, they said OK, called patron	5.00
MYB	Inf. only RQ from General Dynamics relayed by TCU. Checked PC & SC, replied	12.56
MYB	ILLRQ from IIS for 4 items; checked PC, went to 3 for books, all NOS. Checked Circulation records and noted due dates, sent report	15.76
MMS	P'copy RQ from UD. Checked SC, located jls. and took for copy. Waited for copy, returned to 2 and sent reply, left copy for Mrs. B. to post and send	10.33
MYB	Typed interdepartmental charges and vouchers for seven items of copy. Marked records and sent to bookkeeper	15.68
MYB	Patron returned 3 books, cleared records and prepared for mail	10.35
MMS	ILLRQ from TxLT. Checked SC, got jls., took to Miss M. to ask if we could loan because of color plates. Charged them in Periodicals, prepared for mail and replied	19.87
MYB	Rec'd report from TxHU, noted in on records; answered phone call about another loan	7.34
MFM	Worked 4 RQ in Bib. Cen. Verified & left for forms to be typed	35.69
KKH	Took RQ from patron, worked in Bib. Cen. Couldn't verify for sure, gave to Miss M.	12.55
MYB	Worked mail. Posted copy received, notified patrons. Gave ILL forms to Margaret, checked in books, recorded, notified patrons	52.75
MMS	Checked PC on above, located 3. Got books, charged, prepared for mail. Made notations on forms and gave to Mrs. B. to post on records	24.30

Appendix, p. 5

TIME STUDY, INTERLIBRARY LOANS (contd.)

Initials	Operation	Time
MYB	Typed ILL forms. Had to get more mailing labels from supply room to include	11.15
MMS	Took TWX msg. to Mr. Hudson, waited for answer and sent it to NTSU	15.69
MFM	Reworked Karen's problem in Union List. Verified	5.40
MYB	Sent copy RQs to NTSU. Rec'd 2 ILLRQ from TCU. Checked PC, got books, charged, prepared for mail and sent reply	12.42
MYB	Copy RQ from TCU. Checked SC, went to 5, jl. in bindery. Notified TCU	15.10
MYB	ILLRQ from TWU. Checked PC, NIL. Answered	5.0
MYB	Prepared books we are returning for mail	5.20
MMS	ILLRQ from NTSU. Checked PC, NIL. Answered	5.15
MYB	Query from TxCOMT about RQ. Re-checked tear-sheet, had missed it. Checked PC, got book, charged &c., replied	13.50

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AN ANALYTICAL MODEL OF A LIBRARY NETWORK

RICHARD E. NANCE

An Analytical Model of a Library Network*

Networks and network models of industrial and military systems have received much attention in operations research literature. The extension of network modeling to library networks provides some interesting twists of the usual models. A general library network is offered, a mathematical statement of the network problem is given, and the solution of the problem is discussed. An example of the use of the model in evaluation and design situations is provided. The necessity for further work in both theoretical and applied areas is cited in the summary.

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• Introduction

NETWORK THEORY

A directed network or directed linear graph $G=[N;A]$ consists of a collection N of elements x,y, · · · , together with a subset A of the ordered pairs (x,y) of elements taken from N (*1*, p. 2). The elements of N are termed "nodes," "vertices," and, in specific cases, "sources," "sinks," etc. Members of A are called "arcs," "edges," "branches." The interested reader may consult Berge (*2*) or, more recently, Kaufmann (*3*) for precise definitions associated with the theory of graphs. The node-arc terminology used in (*1*) will be followed in this paper.

The study of networks and flows in networks has received much attention in the operations research literature. Theoretical foundations of network flows are given in (*1*), and solution procedures are covered in (*3*), (*4*), and (*5*). Library networks, in some cases, may be analyzed using the existing algorithms for solution of network problems. Simplification under certain assumptions for library networks is possible, but the modeling of library networks in the most general sense requires an extension of the current network models. Extensions of the models and algorithm development for analysis of library networks are reserved for a later paper and are not discussed.

LIBRARY NETWORKS

Consider a process involving the exchange of information among a group of libraries. The information involved may be classified generally into either:

(a) inquiries or messages regarding the availability or location of resources (services, a document or documents, etc.); or
(b) information in document form.

The transfer of information among member libraries constitutes an information network. This network may be modeled by classical methods; however, some important characteristics distinguish such a network from the usual models. The model also is dependent on which of the two classifications of information is of interest. Model development in this paper will be done for (a), and an important difference in analysis for (b) will be identified.

An essential fact regarding the analysis of library networks should be noted. The decision problem for a single library differs from that of a network. Administration of a single library, be it associated with information transfer, personnel, or supplies, etc., has the goal of deriving the most benefit for that library or its users or funders. For a network, the decision problem is to derive the most possible benefit for the total group. In certain cases, this decision process may not render the most benefit possible for any individual member.

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• Model Development

PRELIMINARIES

Consider a network of η libraries. Each library may serve as an initiator or a receiver of inquiries or messages. In addition, some libraries may serve as "message relays," which means that library A, attempting to send an inquiry to library C, may choose to send this message to library B and have B relay it to C. Each initiator, receiver, and relay library defines a node in the network. Nodes are characterized by the arcs related to them.

Initiator
Receiver
Relay

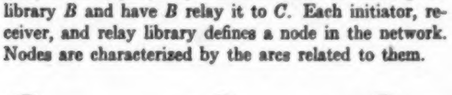
Nodes

A library network composed of η libraries may be described with $2\eta+\gamma$ $(0\leq\gamma\leq\eta)$ nodes, where γ denotes the number of relay libraries. We shall assume the total number of nodes is N; i.e., $N=2\eta+\gamma$.

Arcs

The media over which messages may be transmitted are represented by the arcs joining the nodes. The number of arcs joining any two nodes in the network may vary, since certain pairs of libraries may communicate via LDX, teletype, etc., in addition to standard communication channels such as by person, mail, or telephone. Nodes are linked by a number of communication channels. It is assumed that for each pair of nodes:

1. All communication channels between the nodes can be identified;
2. For a selected time period of analysis, the channel capacity is known and constant; and
3. Associated with each channel is a value determined by the channel used and the node being accessed—this value is called a utility.



The example above shows three channels connecting nodes A and B with channel capacity and utility values identified and known for each.

Channel/Node Utilities

Utility values assigned to a particular channel/node link may represent some combination of:

1. the cost of communication between the two libraries (nodes) using the designated channel;
2. the probability that the library (node) being accessed can supply the desired answer, or perhaps any answer, to the question stimulating the message; and
3. any other factors governing the transmission and reply to a potential message [e.g., the confidence in the answer given by a particular library (node)].

Node Requirements and Capacities

Each library operating within a network has some need to communicate with other members of the network. In turn, each can respond only to a finite number of messages transmitted to it by other libraries within the network. It is assumed that for each library during the period of analysis:

1. the number of messages originating at that library (a_i, i=1,2, · · · , η) is known and constant;
2. the number of inquiries received at that library (b_i, i=1,2, · · · , η) is known and constant; and
3. the set of messages to be communicated within the network is homogeneous.

SYMBOLIC MODEL

A configuration of libraries forming a network can be symbolically represented as in Fig. 1, where the libraries (nodes) forming the network, the multi-channel communication media linking them (double-lined arcs), and the varieties of links that may exist among libraries are illustrated. The number of originating messages and inquiries for each library is shown also. Describing each link (two libraries and the channels connecting them) is a set of channel capacities and channel to node utilities (e.g., [$c_{K(1,\eta+1)}$; $u_{K(1,\eta+1)}$] shown above).

The symbolic model and consequently the general statement of the mathematical model permits two occurrences that are neither necessary nor allowed in library networks:

1. the transfer of a message from a library in the set of initiator nodes to the same library in the set of receiver nodes; and
2. transfer of messages among either initiator libraries or receiver libraries.

MATHEMATICAL STATEMENT OF THE MODEL

In the mathematical statement of the relationships symbolically shown in Fig. 1, the basic notation will be retained. Subscripts, however, are changed slightly from and channel-to-node utilities.

Let

x_{ijk} = the number of messages sent from node i to node j over channel k,
u_{ijk} = the per-message utility for sending a message from node i to node j over channel k,
a_i = the total number of messages initiated at node i during the analysis period,
b_j = the total number of messages received at node j during the analysis period,
$r(i,j)$ = the total number of channels connecting node i to node j, and

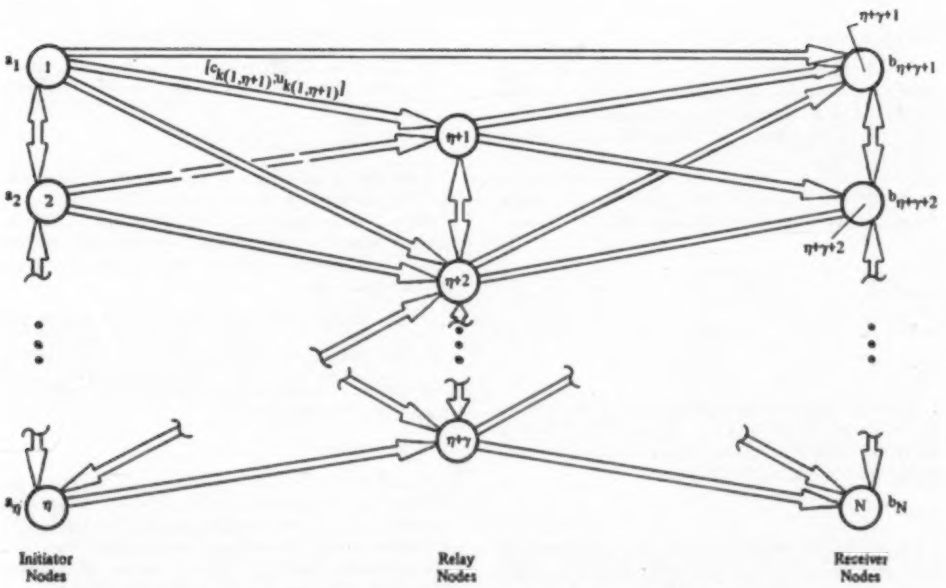


FIG. 1. Symbolic representation of the generalised library network

c_{ijk} = the capacity in terms of messages for channel k connecting node i to node j;

where

$i=1,2,\cdots,N;\ j=1,2,\cdots,N;\ k=1,2,\cdots,r(i,j)$.

The problem statement following the general capacitated network statement (*2*, p. 113) and incorporating the multichannel characteristics follows.

$\max f(x_{ijk}, u_{ijk})$

subject to (s.t.)

$$\sum_{\substack{j=1\\i\neq j}}^{N}\sum_{k=1}^{r(i,j)}(x_{ijk}-x_{jik})=a_i \text{ for } i\in I,$$

$$\sum_{\substack{i=1\\i\neq j}}^{N}\sum_{k=1}^{r(i,j)}(x_{ijk}-x_{jik})=b_j \text{ for } j\in E,$$

$$\sum_{\substack{j=1\\i\neq j}}^{N}\sum_{k=1}^{r(i,j)}(x_{jik}-x_{ijk})=\ 0 \text{ for } i\in R,$$

and

I denotes the class of initiator nodes ($i=1,2,\cdots,\eta$),

E denotes the class of receiver nodes ($j=\eta+\gamma+1,\eta+\gamma+2,\cdots,N$), and

R denotes the class of relay nodes ($i=\eta+1,\eta+2,\cdots,\eta+\gamma$).

In addition, the individual channel capacity constraints give

$$x_{ijk}\leq c_{ijk} \qquad \text{for } i,j=1,2,\cdots,N \quad k=1,2,\cdots,r(i,j)$$

The formulation of the multichannel network problem shown above is more general than is necessary for library networks. The N nodes describing the library network ($N=2\eta+\gamma$) may be looked upon as belonging to one of three mutually disjoint sets or classes of nodes. Within two of the three classes (I = the class of initiator nodes and E = the class of receiver nodes) no path (Y) exists joining any two nodes of the designated class; i.e.,

$$\forall_{i,j}\in I$$
$$(Y_i,Y_j)=\phi \quad (Y_j,Y_i)=\phi$$

and likewise

$$\forall Y_m, Y_n\in E$$
$$(Y_m,Y_n)=\phi \quad (Y_n,Y_m)=\phi$$

For library networks any node from the initiator class (I) serves only as an initiator of messages, and any node from the receiver class (E) receives only. Thus, the second of the unallowable relationships of the general model is removed. The first relationship—transfer of a message from a library to itself—is removed by ordering the libraries forming the initiator and receiver sets. The ordering results in a correspondence between nodes of $\eta+\gamma$ subscript difference in the network; i.e., node 1 and node $(\eta+\gamma+1)$ refer to the same library, in the first case (1) acting as an initiator of messages, and in the second $(\eta+\gamma+1)$ acting as a receiver. Using this ordering relation, no library is allowed to transfer messages directly to itself or indirectly through a relay library to itself. The general problem may be restated as

$$\max f(x_{ijk}, u_{ijk})$$

s.t.

$$\begin{aligned}
&\sum_{\substack{j=\eta+1\\ j\neq\eta+\gamma+i}}^{N}\ \sum_{k=1}^{r(i,j)} x_{ijk}=a_i \quad \text{for} \quad i=1,2,\cdots,\eta\ (I),\\
&\sum_{\substack{i=1\\ i\neq j-(\eta+\gamma)}}^{\eta+\gamma}\ \sum_{k=1}^{r(i,j)} x_{ijk}=b_j \quad \text{for} \quad j=\eta+\gamma+1,\eta+\gamma+2,\cdots,N\ (E)\\
&\sum_{j=1}^{N}\ \sum_{k=1}^{r(i,j)} (x_{jik}-x_{ijk})=0 \quad \text{for} \quad i=\eta+1,\eta+2,\cdots,\eta+\gamma\ (R),\\
&x_{ijk}\leq c_{ijk} \qquad \text{for } i,j=1,2,\ldots,N\\
&\qquad\qquad\qquad\quad k=1,2,\ldots,r(i,j).
\end{aligned}$$

From this general statement of the library network model, extensions or assumptions will permit the development of specific analytical models.

Note that the formulation above permits message transfer in the case where a library serves as a relay and may relay messages that it either initiates or receives. In these situations the need for additional channel capacity or the comparative attractiveness of available channels is assumed to prompt the decision. In essence, when acting as a relay each message transferred through the library (node) incurs the relay "overhead" including those initiated and received by the library itself.

• Development of Specific Model Forms

LINEAR CRITERION FUNCTION

The functional quantity $f(x_{ijk}, u_{ijk})$, which is the criterion function or, alternatively, the total network utility function, can play an important part in the efficiency of any solution procedure for the model. If $f(x_{ijk}, u_{ijk})$ can be restricted to a linear form, the model can be expressed in terms of a linear program (*6*, p. 360). The statement of the model, demonstrating the characteristics of the constraint set, is shown in Fig. 2.

Restricting the criterion function to a linear form simplifies the solution procedure.[1] The size of the constraint set may become quite large. Fig. 2 shows that a network of η libraries with γ of them having the relay capability produces a set of $2\eta+\gamma+r(\eta+\gamma)\ [\eta+\gamma-1]$ constraints, where r is the maximum number of communication channels. The total number of structural variables involved is $r(\eta+\gamma)\ [\eta+\gamma-1]$. In addition to the structural variables, in general, an equal number of slack variables will be required to gain the equality conditions on the capacity constraints. Thus a moderate-size network of 10 libraries with three relays and a maximum of four communication channels might require a linear programming statement with 647 constraints and 1248 variables (including slacks). At the same time, no guarantee exists that the solution will result in integral values of the decision variables. The availability of special algorithms for solving large network problems seems a necessity.

MESSAGE CLASSES

Development of the general model of a library network included the assumption of homogeneity of messages. This assumption may be relaxed, and the model may be extended to allow for different classes of messages. For example, initiation of requests for books may be considered differently from requests for Xerox copies of reports, and specific search requests may be distinguished from generic search requests.

This problem may be classified as a multicommodity network problem. Solution methods for this class of problems are discussed in the two papers by Jewell (*7, 8*).

TRANSFER OF DOCUMENTS

In the opening paragraphs, information is classified as being: (a) inquiries or messages regarding the availability or location of resources; or (b) information in document form. This distinction, which seems quite natural for a library, is necessary for modeling the network in a precise manner. The difference between transfer of messages and transfer of documents is that the decision of the initiator library to send a message to one of the relay or receiver libraries, and the choice of channel over which the message is sent, is assumed to be predicated on the utilities of the channel/node combinations available. The decision in the case of a single document must include whether that document was requested by the destination library as well as the utilities describing the transfer choice. This

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[1] If the criterion function is nonlinear but has "nice" properties (continuity and concavity) the problem can still be solved without undue complexity, since the constraints are linear.

$$\max f(x_{ijk},u_{ijk}) = \sum_{i=1}^{\eta+\gamma}\ \sum_{j=\eta+1}^{N}\ \sum_{k=1}^{r(i,j)} u_{ijk}\,x_{ijk}$$

$$\begin{array}{ll}
I\left\{\begin{array}{l} I_1 \\ \quad I_2 \\ \qquad \ddots \\ \qquad\quad I_\eta \end{array}\right. & \begin{array}{l} =a_1 \\ =a_2 \\ \ \vdots \\ =a_\eta \end{array} \\
R\left\{\begin{array}{l} R_{1,\eta+1}+R_{2,\eta+1}+\cdots+R_{\eta+\gamma-1,\eta+1}+R_{\eta+\gamma,\eta+1}-R_{\eta+1,\eta+2}\cdots-R_{\eta+1,N} \\ \qquad\qquad\qquad\qquad\qquad\qquad\qquad\vdots \\ R_{1,\eta+\gamma}+R_{2,\eta+\gamma}+\cdots+R_{\eta+\gamma-1,\eta+\gamma}-R_{\eta+\gamma,\eta+1}-R_{\eta+\gamma,\eta+2}-\cdots R_{\eta+\gamma,N} \end{array}\right. & \begin{array}{l} =0 \\ \ \vdots \\ =0 \end{array} \\
E\left\{\begin{array}{l} \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad E_{\eta+\gamma+1} \\ \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad E_{\eta+\gamma+2} \\ \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \ddots \\ \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad E_N \end{array}\right. & \begin{array}{l} =b_{\eta+\gamma+1} \\ =b_{\eta+\gamma+2} \\ \ \vdots \\ =b_N \end{array} \\
\text{CAPACITY}\left\{\begin{array}{l} x_{1,\eta+1,1} \\ \quad\ddots \\ \qquad x_{1,\eta+1,r} \\ \qquad\quad x_{2,\eta+1,1} \\ \qquad\qquad\ddots \\ \qquad\qquad\quad x_{2,\eta+1,r} \\ \qquad\qquad\qquad\ddots \\ \qquad\qquad\qquad\quad x_{\eta+\gamma,N,1} \\ \qquad\qquad\qquad\qquad\ddots \\ \qquad\qquad\qquad\qquad\quad x_{\eta+\gamma,N,r} \end{array}\right. & \begin{array}{l} <c_{1,\eta+1,1} \\ \ \vdots \\ <c_{1,\eta+1,r} \\ <c_{2,\eta+1,1} \\ \ \vdots \\ <c_{2,\eta+1,r} \\ \ \vdots \\ <c_{\eta+\gamma,N,1} \\ \ \vdots \\ <c_{\eta+\gamma,N,r} \end{array}
\end{array}$$

I_i = All messages initiated at node i,

$R_{i,j}$ = All messages relayed from node i to node j, and

E_j = All messages received at node j.

FIG. 2. The network model as a linear program

relationship between the item of flow and the nodes from and to which the flow occurs adds a degree of complexity. This extension of the problem cannot be solved by current algorithms.

• A Network Example

The following example of a network analysis illustrates the use of the model developed for optimizing the total network utility for transfer of messages within a library network. The specific objective for this example is to minimize network disutility (the reciprocal relatum to maximization of utility). The size of the problem is small so that the analysis can be followed at least to the point of problem statement.

DESCRIPTION OF THE NETWORK

Libraries *A*, *B*, *C*, and *D* participate in a network. Currently, each library transfers messages to the others by telephone only. On an average daily basis each library has determined its messages initiated and received to be:

Library	*Initiations*	*Receipts*
A	50	55
B	100	45
C	35	95
D	65	55

Data were collected by the libraries to characterize the nature of the decisions regarding the transfer of messages within the network. This data is given in Table 1.

The conversion of cost and probability values to utilities is done by the formula

$$u_{ijk}=\frac{\text{Cost}_{ijk}}{P_{a_{ijk}}\cdot P_{c_{ijk}}}$$

where

i=library originating message,
j=library receiving message, and
k=channel used in message transfer.

This conversion formulation is assumed to produce utility values that are valid for this application and meet the necessary requirements for utilities (*9*).[2]

Conversion of the cost and probability values of Table 1 into utilities results in Table 2, which also provides the channel capacities for sending telephone messages within the network.

TABLE 2. Channel/node utilities and capacities for the network

Originating library	Channel	Receiving library (Cell values represent utilities and (capacities)) A	B	C	D
A	telephone (capacity)	*X*	12 (25)	8 (30)	10 (20)
B	telephone (capacity)	20 (40)	*X*	12 (65)	9 (35)
C	telephone (capacity)	14 (15)	9 (30)	*X*	15 (25)
D	telephone (capacity)	12 (20)	11 (30)	10 (35)	*X*

[2] The values u_{ijk} shall be referred to as "utilities," although they might more appropriately be termed "disutilities" or "expected costs," since the higher value of u_{ijk}, the less the attractiveness offered by the associated value of u_{ijk}. Rather than incorporate additional terminology, u_{ijk} shall be considered a utility with the understanding that for the example problem the optimization objective is one of minimizing the total network "disutility."

The consideration of a linear utility function for the network enables solution by various algorithmic methods. The solution procedures used may produce different decision values (x_{ijk}), but the value of the criterion (utility) function must be the same for any optimal algorithm. Figure 3 provides an optimum solution for this example problem, which gives the minimum value of the criterion (disutility) function as 2800.

AN ALTERNATIVE STRUCTURE

Suppose that the group of libraries forming the network considered the installation of a union catalog within the existing network. The union catalog, which may be described as a relay node, will use two communication channels—telex and telephone. Telex capability will cost the member libraries $4.50 per message with a capacity of 20 messages between any of the four original nodes and the relay node. Telephone communication requires a cost of $4.00 per message with a capacity of 10 messages. Offsetting the high cost of sending messages is the relay node's capability of making

P_a (the probability that the message can be handled

TABLE 1. Values determining channel/node utilities

Originating Library	Channel	Receiving Library A cost*	P_a†	P_c‡	B cost	P_a	P_c	C cost	P_a	P_c	D cost	P_a	P_c
A	telephone		X		3.60	.50	.60	3.20	.50	.80	3.50	.50	.70
B	telephone	3.50	.35	.50		X		3.00	.50	.50	2.70	.60	.50
C	telephone	4.20	.60	.50	2.70	.50	.60		X		3.00	.33	.60
D	telephone	2.40	.40	.50	3.30	.50	.60	2.80	.40	.70		X	

* Cost = the cost per message for transfer over designated channel to library link.
† P_a = the probability that the message can be handled by the receiving library.
‡ P_c = the probability that, if handled, the message is handled correctly by the receiving library.

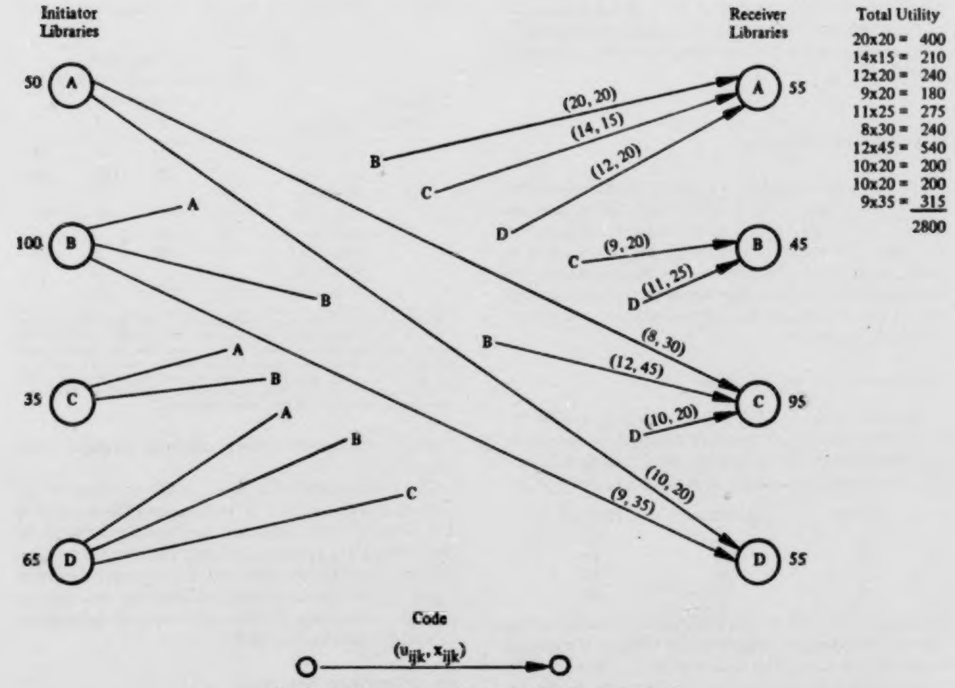
Initiator Libraries
Receiver Libraries
Total Utility
20x20 = 400
14x15 = 210
12x20 = 240
9x20 = 180
11x25 = 275
8x30 = 240
12x45 = 540
10x20 = 200
10x20 = 200
9x35 = 315
2800
50
A
100
B
35
C
65
D
A
B
A
B
A
B
C
B
C
D
C
D
B
D
(20, 20)
(14, 15)
(12, 20)
(9, 20)
(11, 25)
(8, 30)
(12, 45)
(10, 20)
(10, 20)
(9, 35)
A
55
B
45
C
95
D
55
Code
(u_{ijk}, x_{ijk})

FIG. 3. An optimum solution for the library network

by the receiving library) = 1 for *E* and for all libraries to which D forwards a message, and

P_e (the probability that, if handled, the message is handled correctly by the receiving library) = 1 for *E*.

Table 3 provides the values determining channel/node utilities for the altered network. All values for *A*, *B*, *C*, and *D* are the same as in Table 1. The union catalog (the relay node) is designated as *E*, and the utility values for *E* are adjusted upward to the nearest integer utility value.

Table 4, corresponding to Table 2, includes the utility values and channel capacities for the relay node, *E*. In this table the channel/node capacities are shown in parentheses beside the utility values.

The initiations and receipts remain the same within the network.

TABLE 3. Values determining channel/node utilities for the altered network

		Receiving library														
		A			B			C			D			E		
Originating library	Channel	Cost	P_h	P_e	Cost	P_h	P_e	Cost	P_h	P_e	Cost	P_h	P_e	Cost	P_h	P_e
A	telephone		X		3.60	.50	.60	3.20	.50	.80	3.50	.50	.70	4.00	1.00	1.00
	telex				—	—		—	—		—	—		4.50	1.00	1.00
B	telephone	3.50	.35	.50		X		3.00	.50	.50	2.70	.60	.50	4.00	1.00	1.00
	telex	—	—					—	—		—	—		4.50	1.00	1.00
C	telephone	4.20	.60	.50	2.70	.50	.60		X		3.00	.33	.60	4.00	1.00	1.00
	telex	—	—		—	—					—	—		4.50	1.00	1.00
D	telephone	2.40	.40	.50	3.30	.50	.60	2.80	.40	.70		X		4.00	1.00	1.00
	telex	—	—		—	—		—	—					4.50	1.00	1.00
E	telephone	4.00	1.00	.50	4.00	1.00	.60	4.00	1.00	.67	4.00	1.00	.60		X	
	telex	4.50	1.00	.50	4.50	1.00	.60	4.50	1.00	.67	4.50	1.00	.60			

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Table 4. Channel/node utilities and capacities for the altered network

Originating library	Channel	Receiving library (Capacities in ( ) beside utility values) A	B	C	D	E
A	telephone	X	12 (25)	8 (40)	10 (20)	4 (10)
	telex		X	X	X	5 (20)
B	telephone	20 (40)	X	12 (65)	9 (35)	4 (10)
	telex	X		X	X	5 (20)
C	telephone	14 (15)	9 (30)	X	15 (25)	4 (10)
	telex	X	X		X	5 (20)
D	telephone	12 (20)	11 (30)	10 (35)	X	4 (10)
	telex	X	X	X		5 (20)
E	telephone	8 (10)	7 (10)	6 (10)	7 (10)	X
	telex	9 (20)	8 (20)	7 (20)	8 (20)	

A solution for the altered problem is shown in Figure 4. Note that the optimum value of the criterion function is 2610, compared to the original 2800 value. As a design aid, the solution suggests that implementation of a union catalog should be done if the fixed utility for doing so is less than 190 per day over an appropriate "payment" period.

• Summary

Library networks may be modeled as general capacitated networks with multichannel flows when the message transfer function is the only consideration. The assumptions required for such a model may be relaxed to consider classes of messages, but when document transfer is the concern, the general capacitated network formulation breaks down. Development of special algorithms to solve the type of network problems resulting from message and document transfer among libraries is required.

The usefulness of the analytical model of a library network is illustrated in two hypothetical examples. In the first example, the model provides an evaluation tool for indicating how a library network should behave in order to derive the maximum benefit for the entire network.

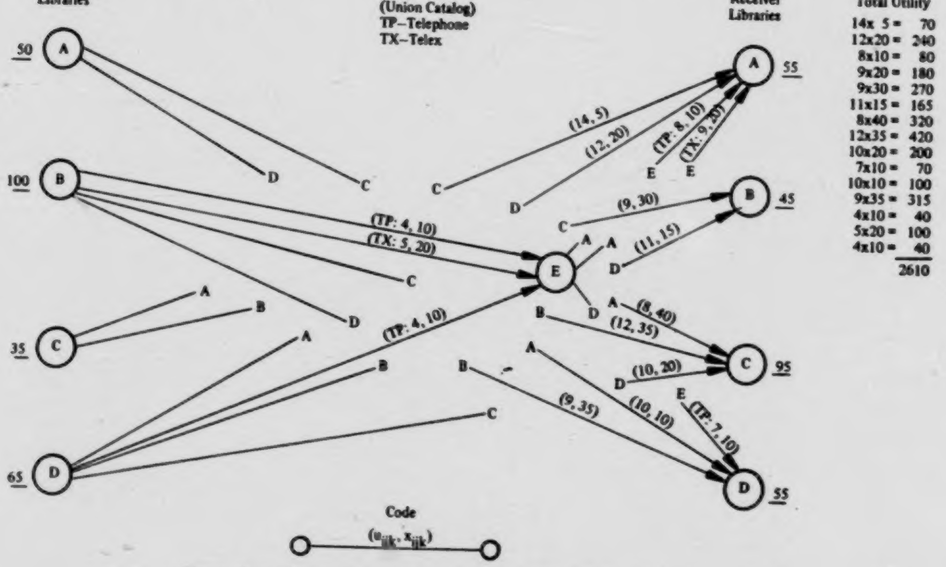
Initiator Libraries
Relay (Union Catalog)
TP–Telephone
TX–Telex
Receiver Libraries
50
A
100
B
35
C
65
D
E
55
45
95
55
(14, 5)
(12, 20)
(TP: 8, 10)
(TX: 9, 20)
(9, 30)
(11, 15)
(TP: 4, 10)
(TX: 5, 20)
(TP: 4, 10)
(8, 40)
(12, 35)
(10, 20)
(9, 35)
(10, 10)
(TP: 7, 10)
Total Utility
14x 5 = 70
12x20 = 240
8x10 = 80
9x20 = 180
9x30 = 270
11x15 = 165
8x40 = 320
12x35 = 420
10x20 = 200
7x10 = 70
10x10 = 100
9x35 = 315
4x10 = 40
5x20 = 100
4x10 = 40
2610
Code
(u_{ijk}, x_{ijk})

Fig. 4. An optimum solution for the library network including the union catalog

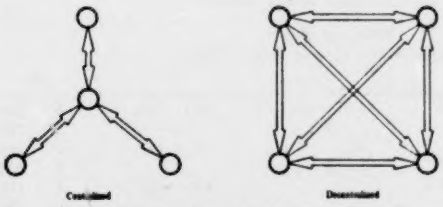

FIG. 5. Centralized and decentralized structure of library networks

The model serves a design function in the second example. Installation of a union catalog within the network is shown to increase the benefit of the network (by reducing the total network disutility from 2800 to 2610).

The analytical model would seem to be useful in some other applications also. The model could be used in specific cases to evaluate alternative structures of library network—the centralized and decentralized, pictured in Figure 5, representing two alternative forms.

Adaptation of the analytical model might be helpful in problems of interfacing existing library networks also. Because of the extremely large number of possible configurations in the interface problem, one would most likely settle for heuristic solutions rather than optimum values. At present, the most restrictive bound on the use of the analytical model for any application appears to be the development of algorithms for its solution.

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APPENDIX C.6

TRANSCRIPTION OF DISCUSSION AND BEHAVIORAL MODEL

Page

(a) Transcription C-157

(b) Analysis of Behavioral Model (Networking Game) C-224

APPENDIX C.6-a

SIGNIFICANT EXCERPTS OF PROCEEDINGS, TEXAS LIBRARY ASSOCIATION REFERENCE ROUND TABLE

Houston, Texas
March 26, 1969

Miss Maxine Johnston, Chairman:

Attention, please. Will all of you now please find chairs and go to the network with which you belong.

The Reference Round Table Texas Library Association's Second Institute on Cooperative Reference and Information Networks is now convened. Welcome to Houston. Your presence here today in such great numbers suggests to us that we have a program which interests you, and I'm sure that you will not be disappointed. First, may I acknowledge our indebtedness to the Texas State Library. Without their continued interest and support and active participation, this and last year's Institutes would not have been possible. Next, there are a few foreigners among us today, so let us identify who we are, what we are, and what we are about.

The Reference Round Table is an organ of the Texas Library Association, which organizes itself into types of library division, and type of activity round tables. Each member of the association may select one of each for his basic dues. Obviously, we represent reference librarians in all types of libraries, or, in deference to the special librarians, we might say documentalists or information specialists, etc. Our Round Table also has chapter status in the Reference Services Division of the American Library Association. Our noble purpose, as defined in our By-Laws is, and I quote, "to advance the informational, bibliographical, and research services in all types of libraries and at all levels within the State of Texas." Now this is the broad umbrella under which we can gather and effect many projects. Many of you are aware that for the last three years the Reference Round Table has been gathering data and planning. The 1968 Institute on Reference Services in Texas Libraries was a tremendous success, and the Proceedings of that conference are now in print and many of you have had an opportunity to examine them. They are on sale in the hallway today. The basis for this year's work was provided by a resolution introduced in our business meeting last year. You have on the tables before you the Minutes of last year's Reference Round Table meeting, and proposal number 2 on the second sheet is the basis for this year's work.

This year the work of the Institute has been planned and quarterbacked by Richard Waters, Chief of Branch Services, Dallas Public Library; and by Maryann Duggan, Director, Industrial Information Services, SMU, Dallas. Later I shall sing psalms of praise to both of these redoubtable librarians. Let us acknowledge now that they have done all of the thinking and most of the work for this Institute.

Since many of you have not had an opportunity to examine your packets, let me briefly read to you the objectives of our work today:

1. To summarize developments (national, state and local) in cooperative reference services since the 1968 TLA Reference Round Table Institute;
2. To explore new thinking and approaches to the examination and use of cooperative reference services since the 1968 TLA Reference Round Table Institute;
3. To apply network concepts to local library situations;
4. To develop an ideal statewide interlibrary reference network through participation of Institute attendees and Official Listeners; and
5. To identify future developments needed in cooperative reference and interlibrary networks in Texas.

Now these objectives are self-explanatory and they need no elaboration from me. While some of them may sound extremely ambitious, we do not apologize for them; perhaps this challenge is what we need to help us measure ourselves against our potential. Reference librarianship has need of our heads in the clouds as well as our feet on the concrete.

And now, may I introduce to you the person who will preside at this meeting today, and who is responsible for its organization: Richard Waters, Dallas Public Library.

Mr. Richard Waters, Dallas Public:

We are going to play some games today and how well we play the game and how well we participate--really get with it--will in a long way determine the success of this Institute.

Now each of you have received--either by mail if you preregistered soon enough, or given today--various bits of information. I'd like to quickly review that with you and tell you what is expected of you some time during the day. Stapled together you should have several sheets, including a program, prefaced by a green sheet. Back in that--near the latter part are some real live cases of interlibrary situations. There are 42 cases, each one identified by a number on the left. Let me first say that each one of you are in a node for a specific reason; we have the MRC node--now, please do not misinterpret--this does not mean the Major Resource Center Library--it means the Major Resource Center Area. So within, for instance, the Austin MRC we should have some people from Austin Public, from the University of Texas, and other libraries in and around that area. We have specific types of librarians such as the health-science librarians or special librarians. Unfortunately, we could not assign everyone according to his job to the right node, but we've done the best we can. We ask that you play the game and participate with us regardless of what node you are in. So during the day, we're going to ask you nodes to answer some of these real live cases; how would you handle this situation? If you choose to appoint a spokesman for your node, that's fine. We're not going to tell you with much advance notice when you're going to be asked to respond. We have floor mikes--one on my right and one on my left near the center of the room--which are on and which are to use. Anyone who wants to ask any questions--make any comment--would they please come to the mikes, because the PA system is hooked up to the tape recorder, and we hope to get everything down here today.

So, in addition to the problems, you've also been given a pink sheet which is a networking sheet. This is a game of "Twenty Questions." At 3:45 you will network your own library. We would ask that each node, beginning with the El Paso MRC and going on down numerically, would answer the question that corresponds to their table number. This will mean that Tables 21, 22, 23 and 24 will not have a specific answer. We may or may not ask you for your answer to those questions, but please do fill them out individually or collectively and leave them at the registration table at the conclusion of the day's meeting.

You've also been given a Glossary work sheet that I think is self-explanatory.

You have a blue sheet of paper, a Critique. Please fill it out individually and leave it at the registration table or, if you want more time, you can return it by mail to Miss Duggan. Her address is on the bottom of that sheet.

And finally, one other piece of work we want you to do is to evaluate this Institute on a white RRT Institute Evaluation Sheet. Again, you may either leave that here at the conclusion of the day, or fill it out at your leisure and return it to Miss Duggan.

I cannot overemphasize the importance of you people doing these things, because we don't know what we have here today, but we think we have several hundred people who can collectively come up with some real ideas as to the future of reference service and networking in Texas--and we need everybody's participation and everybody's thinking.

Maxine mentioned that there were some Official Listeners in the auditorium; I'd like to introduce those very briefly--just ask them to stand--we'll be hearing more from them later. So as I call their names, would they please stand: Mickey Boyvey from the Texas Education Agency; Wilson Fahlberg from Council of Health-Science Libraries; Catheryne Franklin, Graduate School of Library Science of the University of Texas; Don Hendricks, Sam Houston State College; Jan Kee, HEW; James Love, Library Trustee; Stanley McElderry, University of Texas Graduate School of Library Science; Frances Neal, State Librarian for Arkansas; Dorothy Sinclaire, SETINA; Wanda Sivells, Wharton Junior College; Forrest Ward, Texas Coordinating Board; Bob Whipple, Western Information Network Association; Dorman Winfrey, Texas State Library; Jan Wolford, Mobil Research and Development Lab; Heartsill Young, University of Texas Library; Wyman Jones, Fort Worth Public Library; and Richard Yoes, Texas Education Microwave Project. Those are the Official Listeners and we will be hearing from them a little later at various times.

Now, we're on a very tight schedule. We're going to give you an awful lot of information--we hope--today. At least we've got to present it all. We've got to keep moving right along. We have a 15-minute coffee break scheduled this morning and this afternoon. We hope to limit it to 15 minutes. Bring your coffee back to the table. We have an hour for lunch. And now we're ready to start--we're already five minutes behind time.

Richard Perrine--Dick Perrine--Rice University Assistant Librarian in Charge of Planning, who is also President of the Reference Services Division of the American Library Association, and Dr. Ed Holley, who is Director of the University of Houston Library and a consultant on the Library Task Force of the Office of Education Knowledge Network, are going to tell us about some recent developments on the national scene.* (*Editor's Note: All formal papers presented during RRT are reproduced in Section C.5 of the Appendix, with discussion or questions following each paper included herein.)

Perrine Paper (C.5-a)

Holley Paper (C.5-b)

Waters:

On the program you will notice at 10:15 we have a question and discussion period. We have question and discussion periods at other points in the day. These will be used for two purposes: (1) to ask any questions or to raise any discussion about anything that has been said earlier in the day; and (2) to then attack some of these real live situations--these 42 problems that you have ready, presented to you, and that hopefully you have begun some thinking about. You know, when you're moderating a program such as this and then you have to introduce yourself, it's kinda difficult to do, so I'll introduce myself by telling you the one library joke that I know. (Editor's Note: joke deleted.) My charge is to tell you about a survey, and so let's get on with the business.

Waters Paper (C.5-c)

Waters:

It's now time for questions and discussion from the floor. Would you come to the microphone, please.

Frank Wagner, Corpus Christi:

What do you mean by a literature survey?

Waters:

What do I mean by a literature search?

Wagner:

Search, yes.

Waters:

. . . and what you may mean are two different things.

Wagner:

I suspected as much--

Waters:

This is, as I say, one of the weaknesses of this survey, as to our interpretation and our hopes for the answer--

What we intended by a literature search would be that if someone came in to a library and wanted to get say the last--all of the journal data--all of the data available for the last ten years--on a specific subject, and then you would do a literature search and give him a bibliography. That was what we hoped would be the definition of a literature search, but I'm sure that it varies from place to place.

Wagner:

Is there any such service now being offered by any of these networks that you have specified in Texas?

Waters:

I know that I.I.S. at SMU does this for a good sum of money. I think R.I.C.E. does it. I believe TAC in Albuquerque does it. There may be others--MEDLARS on a national basis, or the Texas MEDLARS Research Station. Any other questions?

Yvonne Greear, University of Texas at El Paso, Reference:

How do the libraries involved in CORAL get their users to agree to cooperative acquisitions? That is one of our problems--

Waters:

This I can't answer. You'd have to talk with some of those--

Greear:

Well, that's one of things that I think has stood in the way, many times, of cooperative ventures on acquisitions is that you find your users say "I don't want to be told to use something at another library, or even wait to have it, I want it here."

Waters:

I would suggest that you try to find somebody from the San Antonio area. As I said, I think they have the best thing going in the state down there.

Do you want to transfer that question to the network? To relay your question to the San Antonio MRC? San Antonio, you're on . . . . Don't all get up at once!

While we're waiting for a response--see this is one of the network problems, you know, you get on the network and you've got to get on and off fairly quickly.

(Inaudible from audience---something about using the San Antonio Major Resource Center)

Waters:

Well, you wouldn't use the San Antonio Major Resource Center. Is there anyone there from Trinity or Southwest Texas State? Well, I know there is someone here from Trinity at another table--here she comes now.

Unidentified Person:

I'm from Trinity and I feel a little bit guilty about not knowing the answer to this question because I helped with the survey. From the little I've heard discussed on this subject in staff meetings, I would say that this is likely to have been done on an informal basis--just conversations among acquisitions librarians and perhaps head librarians of the universities and I think probably it has involved major sets--bibliographical sets and things of that kind as well as informal decisions as to which field which institution will buy in. I'm sorry I don't really know the answer to the question, but I'll try to find out if any of you want to see me later.

Waters:

Are there other questions?

Mrs. Shula Schwartz, Texas Instruments, Dallas:

The Texas List is an example of an evolvement of an informal cooperative activity. You said in your statement that the Dallas List and the Dallas-Fort Worth Union List of Serials disappeared. It didn't. It became part of the Texas List, along with the Houston List, and it's an example of local activities evolving into state activities, which finally became a commercial venture. I think that we have to consider in any type of regional activity or statewide activity what is already begun. I think your survey indicates that many of these activities that are statewide or regional now began as local informal cooperative ventures. Are we ready and willing to go into what will eventually have to be commercial type operation? And are we willing to foot the bill? You said that I.I.S. is expensive, or R.I.C.E. is expensive, but the people who are subscribing are willing to pay for it. Now the question comes up, who's going to pay for public library services outside of the area of the taxpayer who's paying for that service now?

Waters:

I hope you're not expecting me to answer that question.

Schwartz:

By the end of the day I hope we have an answer.

Waters:

We hope to get some understanding of an answer today, and I think one of the questions on the Twenty Questions sheet is specifically to that point of financing and legality.

Harold Richardson, with The Texas List:

I heard mention made that someone hoped that The Texas List would take in newspapers, or that The Texas List would maybe become a union catalog of books as opposed to just serials. The Texas List can and will list anything which the budget will allow. If the people want to pay the cost, we will put out a union catalog of every book in Texas. It will be expensive.

Waters:

All right, he's told it like it is! Are there other questions? Go ahead--

Julienne Sprague, Texas State Library:

I would just like to add one comment. I notice that there is a union catalog we use quite a lot that is not listed. It's the Union List of Periodicals in the Library of the Abilene Christian College-Abilene Area, and it is quite useful to us. Others might find it useful to them also.

Maryann Duggan, I.I.S., SMU:

May I introduce this gentleman who is here from Bethesda, Maryland. This is Wallace Olsen, the co-author with Joe Becker of the chapter on "Library Networks" in the Annual Review of ADI. I feel he deserves a little special attention; we're pleased and honored he came all the way from Maryland to join us.

Waters:

You had a question, Mr. Olsen?

Olsen:

I'm not going to make a speech, but I have several questions. Since we're a switching center I'll switch the first one to Dr. Holley. What type of proposals do you think are apt to gain the money this coming year in the network funding?

Holley:

I think that probably we're talking about projects in the neighborhood of $100,000 to $250,000 per proposal. We're probably talking about comprehensive planning documents that deal with things such as costs, models that have generalizability and transferability--that is, more than local type situations--that encourage institutions to get together on things like record keeping, admissions, all kinds of developments of this sort. The linking--the knottiest one--and nobody seems to know why it was put in--is this business on the use of computers. Now I think the interpretations are going to be somewhat more liberal than the initial reading of the act might indicate. That is, if you use computer facilities for developmental purposes rather than the on-going operating and administrative cost, that you may indeed be able to put these into the project, because one of the situations--one of the parts of the act involves specifically the building of inter-institutional library catalogs. Now I think that the instructions will read that funds will be available for producing this kind of an animal, whether it be on film or computer tape, or in printed form, or whatever. I think the attitude of the committee was, or at least the consultants, to stimulate some good proposals that possibly cost a great deal of money but have applicability farther than the local region. There are going to be some preliminary proposals requested, and these will be sifted out and then other--the ones that look the best are going to asked to write rather comprehensive proposals. The funding for a project need not be limited to the first year, although obviously the federal government can guarantee only the first year. But there's a possibility here of having a two or three year project in the comprehensive proposal stage.

Olsen:

I'd like to expand my question, if I may. Is it not true that the multi-media approaches are apt to drag off the greater share of the money as opposed to a simple TWX or teletype network functioning between libraries? I raise this question because it seems to me you in Texas here have immense potential for communications systems, the likes of which I think will be most appropriate under this Act if I read what has happened in the past correctly. May I direct my other two questions--I'll sit down and listen to both of you again.

There seemed to be a reference to three or four industrial library service units, Mr. Waters, in what you mentioned--several that you listed. How do these interfunction now? Could someone give us a thumbnail sketch on what sorts of services they switch between themselves, or don't they work together at all? They seem to be geographically distributed about the state. How now do they interfunction either by telecommunications or in services of any sort? Another question of personal interest--in the Winchell Union List, what is its chief purpose? Is is--the Rice list--is it for referral or is it for location for loan, and if it's the latter I'd like to know how that was overcome?

Waters:

May I suggest that Maryann Duggan answer your first question regarding the industrial services, since she is director of one such service. Dick, do you want to answer the Winchell question?

Perrine:

The true goals of the Winchell list have never been formulated and set down, but I think it is primarily a "finding" list to locate the existence of a particular title in Winchell. We haven't come to the point of loans, and so this is a knotty problem we've not resolved. There is another element of the Winchell list which has not been mentioned so far, but it is hoped that this list can serve as the basis for a cooperative acquisitions program to fill in the gaps that now exist.

Holley:

Since I was in on the earlier part of this, I think that the Winchell list was primarily designed for the public library in this MRC area, and particularly for the smaller libraries who wanted to know where reference items are located. Since under the MRC program they can call and ask reference questions, they could call the closest library to them. That was the way the thing got off the ground. It was not the intention to loan the reference books but to know where they were so that you could direct reference questions to these particular units. Then some of the rest of us got in the program, and it expanded to an acquisitions type situation and is growing on from there.

Waters:

Maryann, would you care to answer his question regarding the interconnection between the industrial networks?

Duggan:

I'll speak of it very briefly. Actually, there are several other nodes in the room who can make a contribution here too. I see Rita sitting over with the W.I.N. node--that's a long way from R.I.C.E.! I.I.S. got started as a State Technical Services Act project. We had great plans; we had great dreams; we had hopes of a statewide communications network where any business firm anywhere in the state could go to their local public library and have access to the specialized information services developed through State Technical Services Act funding. Somehow there's a big gap between plans, dreams and reality and what you're able to really implement. So we have wound up at I.I.S. serving 67 counties in North Texas. We have signed a contract with the Inter-University Council so that any of the material in the I.U.C. libraries can be made available to industry through I.I.S. We have signed a contract with the Technology Application Center in New Mexico so that any of their specialized computer-based searching services would be available to business firms through I.I.S. We are eager to interface with R.I.C.E., with W.I.N., with TEMP, with anybody, but when you sit down to try to interface with some of the other nodes it's like a poker game. These are some of the things I hope we'll see today as we play the network game. What are some of the problems of interfacing networks? Dick listed four criteria of networks; those are the minimum essentials, but if you don't have a common communication channel it's pretty hard to interface. If you don't have identifiable services that you can offer, and levels of services, it's pretty hard to interface. If you can hardly even talk together in a common language, it's pretty hard to interface. So these are some of the fun things we look forward to doing today.

Waters:

Are there other questions? Then let's break for 15 minutes for coffee. It's at the back of the room, and be prepared when you come back.

INTERMISSION

Waters:

Before we have our first report from our Official Listeners, we're going to plug into Node 14, the Houston MRC, and ask them to respond to a case: A small public library is asked by a high school student to get copies of articles on dope addiction from some medical journals. Houston MRC, would you--I'm sorry--Austin MRC--Node 14? Are you organized and receiving the message?

Unidentified Person:

The leader of our node left the room and she would speak to that. Would you go to another node, please.

Waters:

Well, there's another real live problem--see, you switch into a network and the head reference librarian is on coffee break! (Laughter) These are problems that have to be faced and this is the way the game is played, I think. Let's go up here to the very first node, the El Paso MRC, and see if they're ready--

A local judge in a medium sized town needs a copy of the statutes of another state. Does the El Paso MRC have a response?

(Inaudible buzz)

Waters:

Are they organized? How would you respond to that case?

Unidentified Person:

We would refer him to his MRC.

Waters:

He is in the MRC.

Unidentified Person:

O.K., fine. We would--ah--attempt to get it from the--tell the local judge to get it from his county library, or from the Texas Law Library at the University of Texas.

Waters:

Well, are you saying that you kick it out of the MRC?

Unidentified Person:

If we did not have it in our area, we would go outside the area for him, or refer him to the source outside the area.

Waters:

You would refer him? You would not do the referral yourself?

Unidentified Person:

The library itself would do it, or, preferably, if it were quicker to send it to him directly, we would tell him to get it directly from them.

Waters:

All right, thank you. Now there are no right answers nor any wrong answers on any of these questions, and any questions that I might, or anyone else might direct back to the nodes is intended just to illustrate various cases and to see your response.

It's now time for our first report from our Official Listeners, and I think they know who's going to respond. So, Official Listeners, you're on!

Heartsill Young, University of Texas Library at Austin:

I have questions to raise. I can't answer questions at this point--it's a little too early in the game. But this is my response to the discussion so far. I think that it has been made clear by our speakers that while we are developing individual networks in the state and are considering here the development of a state library network--reference network or information network--that we should think of these as cogs in a national system. I want to read you a sentence from the Report of the National Commission on Libraries, "Library Services for the Nation's Needs," and I don't know whether you got this in your packet or not, but the full report of the Commission appeared in the January 1969 issue of A.L.A. Bulletin, and if you haven't read it, I urge you to do so--this paragraph from it:

> "It follows from the foregoing paragraphs that naturally evolving systems that clearly serve the needs of users should be given support in their own right at this time. No one can perceive the final nature nor the quality of a national information system with a single exception. The exception is that such a system will finally be made up of a large number of highly specialized components, each one of which should be designed to serve the needs of a designed user group"

and I would add to this, and so does the report a little later on,

> "be compatible with each other."

We mentioned making available the full range of library resources and so we get into the matter of self-sufficiency. The report of the Commission also touches on this. There are other reasons why libraries can less and less attempt to serve as self-sufficient entities, but must more and more derive strength in membership in regional or national systems or networks. This doesn't mean, however, that at the state level we shouldn't attempt to reach a certain degree of self-sufficiency. But what is this degree? Now one of the components of a state system should be the collaborative development of resources providing for cooperative acquisitions of rare and research materials and for strengthening local resources for recurrently used materials. But, I repeat, what should our degree of self-sufficiency be within the state? The speakers have also touched on two other basic problems relating to development of reference and information systems: those of bibliographic access and physical access. If we are to make the full range of library materials accessible, we are faced with both of these basic problems, which again the National Commission on Libraries considered. We need to identify the resources in the state if we are to develop a statewide system. Now we've made an attempt at this through union lists, union catalogs, etc. These have grown up individually--I think that we would agree that we need some point of central bibliographical control, but I raise the question--what degree of identification of resources do we need? Do we really need to identify every book and every serial owned by every library in the State of Texas? When do you reach the point of diminishing returns? Also, union lists and catalogs, of course, are of value in performing a certain level of reference service; that is, if you know what you want and request a specific author and title, then fine, these union lists serve you well. But now not long ago we received a reference question at the University Library requesting more than this level of service. We were provided with an outline of a thesis and were asked to provide the bibliography and the books listed in the bibliography. Well, we're not prepared to offer this kind of service--but this goes beyond simply requesting titles.

Suppose--and a number of the cases on these sheets reflect this type of service--you are asked for bibliographies. You're asked for a literature search, or you may be asked for abstracts of articles, so the detailed finding list won't help you here. However, a general description of resources will. Now I'm referring to the initial attempt to identify resources included in the Holley and Hendricks study of the resources of college and university libraries in the state in which they identified special collections, describing strengths in general terms.

Now to physical access--you were given a copy of the National Interlibrary Loan Code. I don't know whether one of the later speakers intends to discuss this or not. But if we follow this National Interlibrary Loan Code to the letter, we're going to restrict the service that reference and information networks can offer, and I refer specifically to--let's see, it's "III - Responsibility of Borrowing Libraries":

> "It is assumed that each library will provide the resources to meet the study, instructional, informational and normal research needs of its users, and that requests for materials from another library will be limited to unusual items which the borrowing library does not own and cannot readily obtain at moderate cost. Requests for individuals with academic

> affiliations should be limited to those materials needed for faculty and staff research and the thesis and dissertation research of graduate students."

Now as a member of the Association of Research Libraries, the University of Texas received some months ago a preliminary draft of a "Model State Interlibrary Loan Code." I don't know whether any others of you are familiar with this or not, but it provided for much more liberal lending than provided by this National Interlibrary Loan Code. In other words, I think we're going to have to go beyond the National Interlibrary Loan Code if we are going to develop an effective reference referral system.

Now, we have said that through networks we should make the full range of library resources accessible to all. Do we really mean this? Are we going to attempt to place the total library resources of the University Library at Austin at the doorstep of the local public library? Surely we don't expect the writer of a thesis in a small college to depend entirely on materials located elsewhere in the state. So, just what do we mean by this access? Again, the report of the National Commission touches on this:

> "Means must be found to make the full text of documents available in some suitable form and at locations convenient to all users with minimum delay and at manageable and equitably distributed costs."

This is the point I'm getting at--to what extent do we really intend to make our resources available? What is feasible in this respect? Now, as I say, I've just raised questions, but I think that the Listeners are going to be listening for answers to these questions as the discussion continues. Mickey Boyvey has some remarks to make.

Mrs. Mickey Boyvey, Texas Education Agency:

School libraries are coming late to the network idea. Too long we have been considered autonomous units or characterized by the public library or the college and university libraries as "prime users" but not contributors to this sort of cooperative arrangement. In the 59th Legislature in Texas, educational media centers were created. These are regional media centers--20 in the State of Texas. The next Legislature superimposed on top of these media centers an education service center concept providing much broader services. Now we have this much potential already established in school libraries. Schools also are highly structured from the district level through the regional level to the state level. I think probably schools will have to come quickly to the idea of setting some parameters here where we can fit into a network, what we can contribute, where we can use funds that are available to save duplication of effort to fill in gaps. We are also concerned, of course, with as broad a coverage--a multi-media approach to this--as possible, because we do have access at the regional level, at the large district level, to pretty sophisticated computer services that could tie into this. I think once we look at it a little more closely that we will have a lot more questions that we need to ask these more sophisticated developers of networks to find out exactly what our role is here--what we can contribute, what we can receive. But we're eager--we'd like to work in it.

Waters:

We'll now direct the question regarding the medical journals requested by a high school to the Austin MRC again.

Jeannette Varner, Austin Public Library:

There's some mix-up here. Mrs. Bowden here is the Assistant Director of the Library. She was the one on coffee break. I was here all this time.

Waters:

You mean they don't let the reference librarians take coffee breaks?

Varner:

I took a coffee break, but I was told that I was on a coffee break, so I didn't answer when I was here.

We've been discussing this question at our table and we really feel that it's not a typical question, because the high school student would not ordinarily be asked to provide information from articles in medical journals, but rather be expected to find his information in the general type magazines which are indexed in the Reader's Guide, rather than in ones which would require an index of the medical journals. The type of literature that we've been receiving in the general magazines, particular on this subject--"dope addiction"--have been technical and scientific enough to meet the needs possibly of high school students.

Waters:

Well, let's assume for a minute that he's very specific, and maybe he's an honors student in a senior level program in this high school--

Varner:

Well, at our libraries we would not have the indexes to the scientific medical journals, and we wouldn't have the journals themselves either, so that the question would have to be referred to a medical library.

Waters:

So you'd refer it to the health-science libraries, perhaps?

Varner:

Perhaps, because of course the Texas Medical Association is primarily for use of the Texas Medical Association.

Waters:

So you're switching the question then to Node 18. Would they like to pick it up at this time? Health-science libraries--

Unidentified Person:

If she's in the Austin area, she would refer it to Pauline Duffield at the Texas Medical Association Library, and she has the indexes to the medical journals and would be able to give him any information he needed. Is that the right answer?

Waters:

As I say, there are no right answers, and no wrong answers in this, but we now see an illustration of switching here--switching from the public library to a special library to answer this type of question.

Unidentified Person:

And we do receive many handwritten notes and letters from high school students who write directly to medical libraries: "My project for senior semester is such and such and such--" and sometimes they're quite involved projects too, and in that case we have to usually ask them to refer through their local library to our library, because we do not serve individuals in an outlying town 65 miles away or something like that, so we ask them usually to go through the interlibrary loan system. But we do make any material available through interlibrary loan.

Waters:

Thank you. Other response?

Varner:

That was my point, that I thought we should do everything possible with the local resources rather than refer it to a technical professional library. I actually don't know how much time the Texas Medical Association library would have from the membership--the needs of their own members--to tend to the high school student, which seems to me is the responsibility more of the public library.

Waters:

Thank you very much. Our next two speakers, Marie Shultz and Dick O'Keeffe, will tell us about a preliminary report of a six-month evaluation study of the Texas State Library Communications Network, and Reference Librarians and Networks, a Houston Case Study of LSCA Title III Special Project. Mrs. Shultz, as I'm sure all of you know, is the Director of the Field Services Divison of the Texas State Library. Richard O'Keeffe is the Director of the Rice University Library, and also Director of the Regional Information and Communication Exchange Network. Marie--

Shultz Paper (C.5d)

O'Keeffe Paper (C.5e)

Waters:

Question and discussion period again. Are there any questions that you would like to direct to either Marie or to Dick at this time? (Silence) All right, then, let's switch if we might to Node 15, which I believe is the private college and university libraries, and get their response to the case: A small private university needs a copy of a technical report for a professor who is submitting a research contract proposal. You are that university librarian. Is Node 15 organized to respond?

Miss Mattie Sue Mounce, SMU Science Library:

I don't know that SMU would likely be called a "small private university," but here is what I do when I get a request of this type. If the technical report number is given, I search to see if we have it, because we have NASA and AEC reports and from 1962 through 1966 we received Defense Department Reports because we were one of the technical report libraries that received these reports. I would search to see if we had it first, and the; of course, if we didn't have it and I had the AD or the PB number, I would write for it from the Clearinghouse--order it from the Clearinghouse, and the trouble with that is that it will probably take from two to four weeks, and if the professor needs it tomorrow, you have a problem! But I have recently found out that there are a couple of libraries in the United States--I believe the University of Colorado is one of them--that receive all the reports from the Clearinghouse, and I might try borrowing it from there and see what happens about that.

Waters:

Would you go directly to University of Colorado yourself?

Mounce:

Oh, well, we might try borrowing it on interlibrary loan. I have never done that because I have just recently found out that they do get all the Clearinghouse reports. If the professor were in a great hurry, I think I would try that and ask them to send it Air Mail. It would probably be on microfiche.

Waters:

Any questions or discussion?

Wagner:

I wonder if anyone's had any experience with using the Department of Commerce field offices to put the prod on the Clearinghouse to get some of these reports out fast. We need 'em fast! I wanted them yesterday, not six weeks from now, and sometimes they come back later than six weeks! Is there any experience with regard to the local field office?

Miss Margaret Morris, University of Texas at Arlington:

Our documents people have tried contacting the field office in Dallas without a great deal of success. We have finally ascertained the telephone number of a little man in Springfield, Virginia, and we pick up the telephone, tell the college operator that we need to talk to this little man and ask him to get cracking. And this does speed things up by about three days! It cuts the time down to something like three weeks and three days instead of a month. We also see if SMU has it.

Rita Paddock, R.I.C.E.:

We call Miss Huff at our field office down here. I find that if she sees something interesting in the notices of reports that are coming out, she'll order five or ten copies, and she'll have them down there for us. She'll also call Washington for us. If you have a personal relationship with somebody like that, it's great. It doesn't speed it up all the time, but it helps in a lot of cases.

Waters:

Thank you. Shula Schwartz--

Schwartz:

I have a question I'd like to ask Mattie Sue in relation to where she's going for this report. We're talking here about cooperation and cooperative activities, and I want to know why she never went to any of her special libraries in her local area before she went to Colorado. Most technical libraries and industrial libraries do have a lot of good collections of technical reports, and wouldn't she like to go there first?

Waters:

Switch to the special libraries. Whatever node the special libraries is, would they like to comment on this case?

Richardson:

I know of no special library from my days when I worked in a special library that wouldn't loan any report to anybody as long as it wasn't proprietary. I know when I was with Columbia many of the libraries did request special reports from us if they were in the field of gas technology where we had a large collection.

Duggan:

How did these other libraries know your library had these particular reports?

Richardson:

We sat around and drank beer at the previous SLA meeting!

Waters:

I'd like now to move down the page to Node 17, the Corpus Christi MRC and direct this case: A small public library is requested by a local businessman to compile a bibliography on fuel cells, particularly articles with photographs, illustrations, etc.

Unidentified Person:

I'm with the Corpus Christi MRC. We're not the small library, so I take it that the request is coming in to us from a small library. We also hope that the small library has determined what fuel cells they are referring to, as I believe there are several types. Since I'm not a science specialist, I wouldn't know. If this request were coming in to us from a small library, we would search our own literature first for it, and then if we do not have it we send it on in turn to Austin.

Waters:

To the State Library?

Unidentified Person:

Yes.

Waters:

You would not send it to a special library in your area?

Unidentified Person:

We don't have--but, ah--I don't think one that we'd have in our area would have this material, because they're chemical--

Waters:

All right, then. We've switched it to the MRC, which includes--now remember, we're not talking about the Austin Public Library--

Unidentified Person:

That's right. State Library.

Waters:

You've switched it to the State Library. Would they like to pick it up now, please. Marie, maybe that's you. Or Ann Graves if she--Ann, where are you?

Ann Graves, Texas State Library:

I think first I'd ask somebody who had some information about fuel cells. I think the determining factor here is how technical the material requested is.

Waters:

Let's assume the question has come in and he wants a bibliography or a literature search on everything written in the last five years on fuel cells.

Graves:

Well, I think we would first look in our indexes that we have in our State Library such as the Applied Science and Technology Index. Well, I think probably we would refer it to the Industrial Information Services at SMU to see if they could add to our compilation.

Waters:

Node 19, you're on.

Schwartz:

Well, I have to agree with here answer--that's where it should go, to Industrial Information Services. But, I think that the requestor has to be directed to the Industrial Information Services, because it must be remembered that this is a service that would have to be paid for. So, the businessman would have to be directed to us, and we in turn would make our agreement to provide this bibliography for him or this literature search at a fee.

Duggan:

Why not refer the requestor to R.I.C.E., which is closer to Corpus Christi?

Schwartz:

Oh, excuse me, I forgot where the area was. Or R.I.C.E.

Waters:

Does the R.I.C.E. node care to make any comment?

Wagner:

I'd like to suggest to the Corpus Christi MRC librarian that she might visit some of the special libraries and become acquainted with those in the Corpus Christi region that might have material on fuel cells. I know two which might have that very material, including the bibliography already prepared.

Paddock:

That's what I was going to say. If there is a bibliography already prepared, maybe a special library would have it, but I don't believe that a special library will do bibliographies for other businessmen--you know, this is not something--I had a question more than a comment, on how far a public library will go in preparing bibliographies--this I really don't know--in doing literature searching. What is the limit?

Waters:

Does any public library wish to speak to this question?

Unidentified Person:

I have a question. I don't have an answer to her question. I want an answer to that one too.

Waters:

What's the question first, if we might--

Unidentified Person:

I want to know--Frank (Wagner)--if I asked you that question about fuel cells, would you answer it for me?

(Inaudible comment)

Waters:

We've got several librarians from the MRC libraries--the public libraries here. Would one of them like to answer Rita's question as just to how far the public library would go in preparing a bibliography of this sort? Mr. Harper--

Alvin Harper, Dallas Public Library:

Ordinarily the public library would tell the patron, "We have the index material" and invite them down. We don't have the staff nor the time to compile bibliographies for everybody who needs bibliographies. I'm sorry.

Waters:

I think what we've seen here is a need for some of this bibliographic control, or access, or knowledge as to where things are. If I understood what Mr. Wagner said correctly, this question was switched to two or three places when the answer was right there in Corpus Christi where somebody had already done the work. There was a printed bibliography on this particular subject, but we didn't know this. So where--how do we find out about these things? And so on and so forth--

Well, it's just about lunch time. We'll see you all back here at one o'clock.

NOON INTERMISSION

Waters:

Before we have our second Official Listener's report, I think we'll ask another question or two. I'd like to direct this one to Node 11, the Abilene MRC: A teacher in a high school in a large city has asked the local building librarian for transparencies illustrating the circulation system of a frog. Is Abilene organized?

Helen Smith, University of Texas at Austin:

There's no one here from the Abilene MRC. I think the key to this could be "large city" in that you would have a media center in which the transparencies would be available, or would be made. In some cases the teacher may go through the librarian, but in many cases I think the teacher would go directly to the media center herself.

Waters:

Any questions? All right, let's jump down to Node 3 here, up in the front--the school librarians: A teacher in a local elementary school asked the building librarian to get a copy of an article from an education journal on new teaching methods. The teacher is taking a credit course in education from a nearby state university. Are the school librarians organized? Question 12--

Boyvey:

This would probably go to the central office level in the district first. Most central office levels do subscribe to most journals that are used. If not, the school librarian would probably go directly to the nearest teacher training institution at the college level for this, and it would come back on interlibrary loan, just a printout on it.

Waters:

Well, let's assume it was switched to the state colleges and universities, which is Node what--12, I believe? Would they like to pick that up now? Any representative of the state college and university libraries? The question has been asked, "Should the building librarian of that school serve the teacher on that kind of a need?"

Millie Gervasi, Southwestern University:

We're not a state college, but we sure do believe in them. But if I were in a state college and this came to me on interlibrary loan, we just simply communicate with them and ask if they would like to have photocopies. We prepare that after receiving their O.K.

Waters:

All right, thank you. Let's now have our second report from the Official Listeners. Again, I will not call on a specific person-- I think they are ready. Listeners?

Miss Jan Wolford, Mobil Research and Development Corporation:

I don't have any answers either, but I have some questions that have come to mind. I wondered first of all about the make-up of the people in these different nodes. Just for curiosity, could we have a show of hands?--how many of you wonder why you're at the node at which you're sitting--that you really don't understand? O.K. Well, that shows something.

Another thought I had, this wonderful world of networks that we've been hearing about--it strikes me that at the top we're getting some understanding of the philosophy, but down at the working level we seem to have a little confusion. I'm not quite sure at what point switching should occur, and what types of questions. And in the playing of this game it strikes me as--beginning to show.

And my last comment is on the I.I.S. literature searching. As for the cost, if we didn't think it were worth it, we wouldn't pay for it.

Waters:

Are there other reports from the Official Listeners at this time? All right, let's move on then. This morning Dick O'Keeffe told us about the Title III special project involving R.I.C.E. and Houston Public Library. He referred to a second special project being done under this title as it involves the Dallas area and the Industrial Information Services at SMU. Maryann Duggan will tell us about the Dallas Pilot Model. After Maryann tells us about the Title III project in Dallas, Francine Morris, who is the reference librarian at the University of Texas at Arlington, will tell us about "Games Librarians Play, or a Day in the Life of an Interlibrary Loan Librarian." And then will come the most challenging thing we'll have presented to us--at least intellectually--this afternoon, when Dr. Richard Nance of SMU Institute of Technology describes "Model Library Networks and Library Network Modeling." Dr. Nance is not a librarian, but he has worked closely with libraries both in SMU and before that at Purdue where he did get his Ph.D. The Library Operations Research Study Group he was associated with there, and he had a special interest in automated information research and storage, as well as operations research. We will then have another question and answer period--discussion period--at the conclusion of Dr. Nance's presentation. So let's back up now to the LSCA Title III special project in Dallas. Maryann--

Duggan:

This whole meeting today is an experiment to see if we can put ourselves in the role of the real library world here in a room--in an artificial environment, and this came about in brainstorming how to fulfill the charge that Dick Waters, Dick Perrine and Maxine Johnston issued to design a so-called "ideal statewide interlibrary network." And I want to share with you a little bit of our experiences on which kind of triggered this experience this afternoon.

Duggan Paper (C.5f)

Waters:

All right, let's get back on the network here and let's see--let's go to Node 16 which is the Fort Worth MRC. Let's ask them to respond to Case Number 8: A local businessman needs recent census data on population statistics in another larger city in the state.

Miss Janice Gohmert, Fort Worth Public Library:

I assume this comes from either one of the number 3 or number 2 libraries to a large public. This material is available in the MRC library; if the man is a Fort Worth user, he would be directed to come to the Fort Worth Public Library. Otherwise, the material would be duplicated and mailed to him.

Waters:

So you would handle the question in the MRC Area? All right. Let's see who we haven't asked anything of. Oh, let's go to Node 8. Have we asked Node 8? Which is W.I.N.* I was told in the hall at lunch time that nobody at Table 8 knows anything about W.I.N., but we won't let that throw us. We'll just ask the question anyway, which is Question 40:

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*Western Information Network

An employee of a business firm in the suburbs of a large city is taking a college course over closed circuit TV from a distant state university. He needs a book. Where should he go? Node 8? Have we got a respondee?

Unidentified Person:

Well, I just joined Table 8, so I'm not qualified to answer, and I don't know anything about W.I.N. either. But it strikes me that you want to know what kind of a book. If it's a textbook, I think he ought to buy it out of his own pocket. If it's supplementary reading and it's a large city, I think he ought to go to the public library, and if it is an MRC deal and they don't have it in the public library, I think the MRC should take over. Thirdly, I suppose his distant state university might be somewhat concerned and have sent him a reading list with some idea of where he could get the material. I don't know about that last part because I haven't had any experience with it.

Waters:

Well, does that state university have an obligation (since it is their TV course that this man is taking) to furnish him with the information as to where he can get the book? Would Node 12, the state college and universities, care to reply? Who is the primary group here--the local public library or its branch? Or the agent who initiated the request, or the need for the request--the state university? Are state and college universities prepared to speak?

Young:

I can't give you an answer, but this raises the question again of the clientele the library is to serve and the purposes for these loans. And let me digress a little bit and get back to questions which have been asked over and over here. Our last Official Listener asked "What kind of book?" And we've had this question asked over and over. The one regarding fuel cells--the librarian asked "What kind of fuel cells?" And what level--that is, what is the purpose for which this bibliography is to be used? The one pertaining to drug addiction--articles in medical journals--and the question was raised--does the student really want articles at this level? The question pertaining to statutes of another state wanted by a Texas judge--well, I think the decision was to refer it to the law libraries, but then, wouldn't they ask a refinement of the question; that is, what statutes? Or statutes on a particular subject--surely not all the statutes of another state? And so we come to this importance of the initial face-to-face contact, at which point the reference librarian finds out exactly what is needed, the purpose for which the information is needed, and it seems to me that this is one of the most critical steps in the whole network process--finding out initially what's called for, or otherwise you'll end up with information that doesn't serve, like copying the articles from medical journals and then finding that what the student wanted was something at a lower level. And I hope that the question will be answered eventually: "To what extent is refinement of the initial question necessary?" I think some of those who have had experience with operation of networks may be able to answer this question.

Waters:

Let's keep that question in mind, because, as Heartsill has pointed out, it has come up almost every time. It's not directly--been directly implied.

Morris Paper (C.5g)

Nance Paper (C.5h)

Waters:

Before we break for coffee, let's see if we have any questions or any discussion about anything that Maryann or Francine or Dr. Nance has raised in their presentations. Mr. Wagner--

Wagner:

I wonder if Dr. Nance is the one who left the definition of "algorithm" blank in the glossary?

Nance:

Definitely not--an algorithm is nothing more than a set of rules. I just probably did not communicate. The channel was over-capacitated!

Waters:

Shula--

Schwartz:

I'd like to direct my question to Maryann in relation to her survey on the interlibrary loan activities in the Dallas area in one month. I wrote down your figures. You had an overall 43 per cent bomb-out, 76 per cent public library bomb-out, 49 per cent state and so on down the line, to--I believe it was--one point something per cent in junior colleges--that's what I forgot to get, and we notice it begins to go down the line to the smaller units. Now is this really a question of the library receiving the request not fulfilling its obligation, or is this really a reflection upon the library placing the interlibrary loan automatically assuming that the larger unit will have it and perhaps being more selective in what they send to the junior college, special library, and so forth?

Duggan:

Shula, we don't really know the answer to that. We don't know why the free public library system as surveyed was unable to fill 207 requests in one month. Now we don't know whether that's because the requests really should never have been sent to them, or whether this is a reflection of the need to build resources, you see? Maybe our resources are simply inadequate. We do know that the public library system received a total of 276 requests, which is 14 per cent of the total number of requests transacted in the Pilot Model. The state university system that we were studying received 12 per cent of the requests, and they were unable to fill 49 per cent of the requests they received. The private university studied--it's interesting, it turned out for that one month that they, too, received 12 per cent of the total number of transactions in the Pilot Model study. They were able to fill all but 18 per cent, you see? So this is interesting. We've got to go back and find out why this is. You can conjecture that maybe people are more selective in sending requests, for example to the private universities, although the number of requests was essentially the same as what the state universities got, but the private university was able to fill them more, and yet I feel reasonably sure they don't have any better resources. You go down to the special libraries, and the industrial libraries, they received 11 per cent of the total number of transactions in the Pilot Model. They were able to fill all but six per cent of them. So again, this looks like--it looks like if you'll go back--when we go over the so-called "ideal components" of the network, that this selectivity of what you put on the network and who you direct it to is important in your success of completing the transaction. There are lots of questions here: What does it cost to handle this total of 443 transactions which were not successful? We feel in I.I.S. in our studies that every time you get a request for a document it costs you almost as much to check that out to see if you have it as it does to ship it. So, this is an interesting study. I'm sorry I can't give you the exact answers. We hope, with Dr. Nance's model--now we can begin to input some of these data and see what happens when we change the operating parameters.

Waters:

Yes, a question in the back?

Andrea Edwards, Houston Public Library, Interlibrary Loans:

Regarding the number of requests that are not filled by the public library, I think the public library has become a dumping ground. You get the feeling, and you can ask any reference librarian, and people that call you up will say, "Well if I can't answer that question, I'll call the local public library." And there's one reason you can't answer all these questions, because some of them are so specialized on such type information you cannot answer. Then it comes up to the thing of time. When you get all these requests coming in, you have one person working on interlibrary loans or with reference, you don't have time--you can't answer that--you can't answer this question. You know probably where you can get the information, but then you don't have time and that patron doesn't have time to get it back, because you don't have the staff to do it. And that's one reason the public libraries just cannot answer, whereas the university libraries might have more staff to work with. And then when you're sending to the special libraries and university libraries, we don't even send them questions that we don't think they might have. So, they're not going to get that many questions, because I think public libraries would not send a special library or a university library a question or some request that they wouldn't have. So, more likely the university libraries are going to be able to answer requests that come in rather than a public library where we get just everything coming in.

Waters:

Is there a comment over here?

Unidentified Person:

Well, I want to defendthe college libraries a little bit. They don't have the staff that the larger public libraries have, but they do have someone to concentrate on interlibrary loans. In the public library--we do it in addition to everything else, and that makes a big difference.

Waters:

Maryann--

Duggan:

We're just trying to get the facts, ma'am. We're making absolutely no value judgments. We're simply trying to take a reading and see what is happening, and I think you have to have a "willing abandonment" of disbelief--you have to try to approach this semi-scientifically. One of the things I heard recently made me feel better. After Dick Nance had struggled and struggled with his algorithms for working out these interlibrary network relationships, he shook his head, and he said, "I don't see how you librarians have been doing it. This cannot be computed mathematically."

Waters:

Shula--

Schwartz:

I didn't intend to get an argument started over public library service versus university library service. What I want to ask--or just throw out really, is--we're talking about developing networks and we're talking about utilization of these networks, and what I was trying to emphasize (or to find out in order to emphasize) is that one of the things we hope to accomplish eventually in a network is development of resources. But I wanted to be sure before we assume that public libraries have not fulfilled these because they don't have the resources--to get back to us as librarians, to be careful how we present our requests and to whom we present our requests, that we can do this on an informal basis and not be hurt. But if we're going to tie in to a network which is going to cost money, that we should be sure that our requests are not wasted, and that we know these factors that enter into who we send our requests to. I didn't mean to start any arguments, I just want to clear that!

Waters:

Any other comments at this time? Well then, let's have coffee break now and be back 10 minutes after three.

AFTERNOON COFFEE BREAK

Waters:

In a little while we will have our third report from the Official Listeners, I think we'll play the "network game" a little bit now, and we'll turn to the Dallas MRC and ask them to reply to this case: A professor from the local university asks a local branch library in a large city for a government document on lawn care.

Unidentified Person:

I'm representing the Dallas MRC. If a professor came into the branch library and asked for a document, first of all, we'll take it generally that he just said he wanted a document on lawn care, and if we have done selection properly, our vertical file may contain this pamphlet on lawn care. If not, the central library of the Dallas Public Library is a partial depository. Therefore, hopefully we would gain a line to the main library as a patron to ask the question of our government documents librarian: Do we have such a document? After perusing the Monthly Catalog, he would determine whether or not we had such a document. Now if we do, we still must send the patron to the central library, because the document is not sent to the branches. Now, more hypothetically, let's say this: that upon questioning the patron we actually find out that the professor does not want a general document on lawn care, but really wants to know what is the latest chemical available on how to kill grubworms in a St. Augustine lawn. Now, we found out the specific information he requires, and he doesn't really necessarily need a document. He just thought this would give him the latest information. He wants to know the chemical. So, in most cases, since he wants the very latest information, we would still call our central library and relay the message. Now, hopefully, the Dallas Public Library could answer the question. If it still could not, the patron's request would have to go on Telex, or better still, hopefully the Dallas Public Library would call SMU who, in turn, through the Inter-University Council, would answer his question.

Waters:

Are you suggesting it might be turned over to I.U.C.?

Unidentified Person:

Yes, sir.

Waters:

All right, I.U.C. node, would you like to pick it up, please?

Joe Bailey, Public Services, North Texas State University Library:

I'm probably the only member of the I.U.C. Council on Number 20, so it simply means that I'm the authority in the field here today.

We wouldn't have any trouble, I don't think, in filling the government document request, either out of Arlington, out of SMU, or North Texas State. But I suspect the Dallas Public would have it.

Waters:

All right, thank you. Let's switch up here to the junior college node, Node No. 6, and ask them Case 35: A local housewife has asked the local junior college to use the French I language tapes to prepare for a trip to Europe.

Frances Pye, Brazosport Junior College: It just so happens that's the one we didn't discuss at the table. I'll have to answer it by myself. First of all, it would depend on whether you have an agreement to allow your materials to be used by your local clientele, and sometimes this is possible. However, at our particular junior college, this agreement has not been worked out. So if I could arrange with the classroom teacher to allow this person to go to the lab and use them, I would do so. If not, there is a service from the University of Texas, I believe, a tape service where you can send a blank tape and have tapes made for this person.

Waters:

All right. One more before we have a Listener's report. We'll go to the Houston MRC (Node 22) and ask them Case Number 30: a large public library has been asked by a local businessman to borrow a copy of an out-of-print American imprint on the history of banking in Europe.

Edwards:

Ah, well, we talked about this, and we felt that if our library didn't have it, we would check the local libraries here in town to see if they had it--University of Houston and Rice--but I think, too, usually we check everybody in town that we think might have it. If there is a business organization that has a library, we'll check them first. And if it's not here in town anywhere, then we'll try our state library because we're hooked up in that network--to see if anybody in any of the other ten major resource libraries has the item. If the patron has time--it depends a lot on whether the patron has time--if we can't find it here in the state public library, we go to the special libraries. At least we here at HPL go to the special libraries--check the directory for the special libraries and see what business libraries might have the publication and borrow it from them. That's the normal process we go through.

Waters:

All right, if I interpret you right, after checking--and we'll assume for the sake of discussion, unsuccessfully, in Houston--you couldn't find it, you kicked it out of Houston and went to the State Library, put it on the State Library communication network. So, Austin MRC--or better yet, perhaps Ann Graves--if she's still with us--how are you going to handle this request?

Graves:

Well, first we would communicate with the other--with the 10 MRC libraries to see if it was available in any public library with which we can communicate in the state.

Waters:

Well, may I interrupt?--would you ask them one by one or would you pick out one in particular?

Graves:

We would query them one at a time individually, starting with the nearest library geographically.

Waters:

Nearest to Houston?

Graves:

Yes, nearest to the borrowing library. After we try to locate the book in one of the 10 MRC libraries, we usually look it up in the National Union Catalog to see if a library in Texas has it. Then we look in our Subject Directory of Libraries and try to find an appropriate library, either a university or a special library, and we type the request on an interlibrary loan form and send it in the mail to an appropriate library.

Waters:

All right, let's continue this assumption then and assume that you found it at a private university library in the State of Texas. We won't say which one, we'll just say a private university in the State of Texas. We've ruled out the Houston area, because Houston Public checked it here and couldn't find it, so would Node 15 like to pick it up now?

Georgia Frazer, Rice University Library:

The group of people that are at this table have felt that in answer to this question, that if the private college or university has a copy of this particular imprint, they would send it to the other borrowing library on interlibrary loan.

Waters:

So the fact that it is out-of-print wouldn't mean that you would want to keep it in the house? You would send it on loan?

Frazer:

It would still go on interlibrary loan. If they did not have a printed copy and it was on a--let's say, a microprint copy--it would possibly go on interlibrary loan.

Waters:

All right, Maryann--

Duggan:

How many transactions have we had for that one request now?

Waters:

Well, it came from the local businessman to the Houston Public Library, it was not in that collection, so I guess that's one transaction. They checked Rice, the University of Houston, maybe three or four special libraries in the city, maybe two or three special collections in the city--

Duggan:

How did they check them?

Waters:

By guess and by gosh, I guess.

Unidentified Person:

We telephone them and ask the librarian.

Waters:

Yes, but you'd have to have some reason why you'd telephone Person A as opposed to Person B, would you not?

Unidentified Person:

For libraries in the city, you don't, because you don't know their resources so what you do is go by--you know--what you know about that library.

Waters:

So you'd have a frame of reference here as to what you've been able to procure from a library, or what their strengths might be? Some of what Harold said this morning, drinking beer after a meeting, you've kinda learned who has what. Yes?

Duggan:

In our Pilot Model study preliminary data we found that the success ratio of hits for monographs, which as this illustrates, was terribly low. There were as many, sometimes, as nine requests before they were eventually filled. Now I don't know how to tackle this. Does the absence of a union catalog mean we're really struggling here to find these things? And I don't mean to be pointing at any one library, I just want to ask a question: If you had a union catalog, a National Union Catalog and knew that, say, the John Crerar Library in Chicago had that monograph--that out-of-print book on the history of banking in England, would it now have been preferable--I'm asking, I don't know--for the Houston Public or whoever was contacted first, to go, say, directly to the John Crerar instead of getting on the network?

Waters:

Here's an answer perhaps.

Sprague:

I'm the interlibrary loan librarian at the State Library, and when we get a request of this nature, we, of course, assume that Houston has exhausted their resources. When it comes to us, we place it on the network and query the other MRC's. Houston should have explained to their patron that the public libraries will be checked first. If we don't find it in a public library, we send the request to a library in Texas if the National Union Catalog indicates that a library in the state has it. If not, and the patron is a legitimate patron--the professional businessman, not a high school student--we will go to the Library of Congress.

Waters:

But you'll do that after you've queried the nine other MRC libraries?

Sprague:

Yes, unless a rush has been indicated. We do query the public libraries because the request has been placed on the public library system.

Waters:

Yes--

Morris:

Dick, we don't handle it quite the same, but for what it's worth--I think the other academic people will probably agree with me. When we receive a request, we check N.U.C. first, to find out--well, not only to verify the information of course, but if a library in the state is listed as having it, unless it's--and I say this in all kindness and candor--we do not bug the University of Texas at Austin if we can possibly avoid it--because the poor souls down there have more than they can do anyway. If the thing is available at O.U., we will go to the University of Oklahome before we hit Tech or the University of Houston, because we have discovered that we have fast mail return there. In our case, we work on expediency as opposed to channels, which may defeat the idea of networks, but on the other hand this is the way we do it, and I think a lot of other people do too. If all else fails, we write N.U.C. and say, "Dear Mr. Schwegmann: Do you know anybody who has this wretched book?"

Duggan:

Why do you write him--why don't you teletype him?

Morris:

Because they don't have a teletype in the catalog file room.

Unidentified Person:

I may be changing the question, but I would just like to throw out a question. When she said to check the Union Catalog and find that the Library of Congress has it, but she would check the others in the State of Texas first to see if they had it, unless it was a rush? Is anyone else experiencing the problem? I was telling someone today, my--one of my latest worst cases from the Library of Congress is 19 days mail problem. They mailed it 19 days before I ever received it. Is anybody else experiencing this problem with mail service--you go out to your local libraries--I think in the State of Texas first--even exhausting all the universities and everything else, because it's taking so long to come from farther points. I have, at least, experienced this, so I'm just wondering if I'm the only one that experiencing a mail problem?

Waters:

Does anyone want to respond to that? Or show hands as to who all is experiencing mail problems? (Must have been overwhelming from the laughter.)

Unidentified Person:

Would anyone care to stand in line behind me on this? This was something that was mail problem with us, not from out-of-state, but a package that was postmarked and dated in Austin and I received it 10 days from the time it was dated. In other words, the package was mailed on, say, the 13th; we received it the 23rd. So we don't know where the hangup is; we suspect that it could either be their outgoing mail or our incoming mail, or perhaps even between in the U. S. Mail.

Waters:

Or a combination of all three, perhaps.

Waters:

Well, to answer Maryann's first question, I think we've had about 20 transactions here on this out-of-print imprint before it had been filled. This is very costly. If what someone said is true, that is, it costs as much to check it and not have it as it costs to check it and send it. This is one of the real problems. I see a hand--or saw a hand back in the back. Fred, was that you?

Fred Abrams, Rice University:

Assuming that the private institution has received the book, who gets the book? The State Library or the public library? And who gets notification on this book? Because we've never encountered a situation like this.

Waters:

Well, now, the State Library sent the loan request to the private university. Did they say to send it back to the State Library or to send it directly to the public library?

Shultz:

We say to send it back to the public library which initiated the request (that is, the borrowing library) and we notify the borrowing library that it is being sent by the library which is sending it.

Unidentified Person:

If we had received a request at our college library from the Texas State Library, then we'd send the book back to the State Library.

Waters:

Even if the State Library asked that you send it directly to the borrowing library?

Unidentified Person:

It depends upon the particular message which I had received. Let's say that they did not say that it would be sent back to the Texas State Library, but if the message came from there--well, first of all, logically, at least in my way of thinking, that if the question came from the Texas State Library and they said to send it back to the Texas State Library, I would send it there. I they did not, I think logically I would have chosen to send it back to the Texas State Library anyway.

Waters:

All right, I think we'd better move on now and have our third report from our Official Listeners.

Dean Stanley McElderry, University of Texas at Austin GSLS:

I have a feeling I should start out by saying,"Mission Control, this is Gumdrop. We are in orbit, do you still read us?"

In responding to some of the questions on the third report, I wanted to just state a few reactions to where I think we are on the network concept. I think we're talking at a very preliminary design stage where we understand generally the concept. Our thinking is based primarily on our current level of technology, and we can see some potential solutions to the problems that have just been discussed here. I think we can see the general organizational structure required, which is based on a recognition that we are interdependent upon each other and that some way of cooperating has to be worked out that is better than the current method. I have a feeling that improvements are going to come very slowly in the area, and that we won't see a solution to the kinds of problems discussed here very soon. The reason for this is that I think we need much more detailed, specific information about what the information needs are on the local basis. I think we have to define what level of service we're going to provide. We can't assume that information needs generally from any source are going to be handled in the same way that we would handle requests for research material, which is a large basis for interlibrary loan activity now. In other words, we are going to have to evaluate information needs of school children, the general public in a community and others, and decide just how far a local library ought to go. I think once we know the nature of these requests, and in much more detail than we do now, that we'll be in a position to define the resources required locally, which is where I think we have to start. I don't think that we can make the assumption that our objective is to share what we have throughout the State of Texas or throughout the United States. I think we really assume much more of a structure than that.

I think it is obvious that the access to bibliographic information is far too limiting now in order to share adequately the resources that do exist for whatever purposes that we feel are legitimate. Until we have more detailed information about resources in various kinds of libraries, whether they are in nodes or in the State Library or whatnot, we're just not going to be able to respond very easily. We tend to transfer the burden of running down material from one library to another without any formal compensation between them, and we just simply can't do this efficiently without recognizing what it costs. I think the ability to transfer information, to provide physical access to information, is going to be a long time coming; that is, the technology that theoretically is available, I don't think is going to reach us very soon. I think we're still going to depend very heavily on U. S. mails or maybe station wagon delivery from the libraries in a geographic region.

Now, looking generally at some of the questions posed to this group, I think it's obvious that we've got to define what the problem is much more thoroughly before we can decide what problem solving strategy we're going to use; that once we have detailed enough information that we can evaluate--it has to be a very broad sampling at different levels--then we can make some assessment of what the need is. The modeling presentation was based on evaluation of communication channels, and I think it's obviously desirable in that context; I think modeling also has other applications. We can't afford to build a network of information systems without knowing what the outcome is going to be in more detail before we start. In other words, it's too expensive; it takes too long a time. We've got to use some simulation techniques to make some of the basic decisions, so I think it will be very useful there. In regard to a network theory, if I understand theory in the general sense of describing a generalized phenomenon, I think that obviously we will be able to describe a network theory when we've been able to design it more adequately, and I don't see any problem there.

The question in regard to the most important utility within the library or the network of libraries--if by utility we mean the resources we have to work with, such as the materials, the people, bibliographic equipment, communication systems, and so on, I'll put my bet on the people all the time. They're the ones who, because of their intelligence, experience and ingenuity, can really make the system work. Without them we have nothing.

I'm distressed over the question of who pays for the network, because I think our system of libraries, particularly in the public field, is based on the library as a public utility. I think when we begin to look at it in terms of people paying for the information that they use, that we're going to destroy the basis on which public library service is rendered today. I think it's obvious that people need information to conduct their business and daily lives--and this is sort of the basic assumption that we operate on, that we should make this as widely available as possible. When we put it on a dollar and cents basis I don't think people are going to use it as they would need to. There are many cases--well, one of the ones that I can think of most obviously is when something like audio-visual services in an academic institution are put on a charge basis, the use suddenly falls off, whereas if you support it broadly through a university or college budget, then it will be used in accordance with the way people feel it can be used. I think this is the way library service should be.

I think the borrower/lending ratio zone technique at the present time is a kind of poor basis on which to evaluate funding. I think we've got to exploit information as fully as possible to see what the real need is, and build up resources as much as possible before we begin to evaluate what the transfer of information is under existing conditions. This is like trying to meter the use of water when your supply is a well, rather than when you have modern plumbing. Until you have these kinds of facilities, it's hard to tell what the real need is, and we know that as improvements in service come about, then the demand increases.

I think it's obvious on the last two questions that technological changes--developments in networks--are going to have a substantial impact on the way libraries operate, and I think the library training agencies are certainly going to take a hard look at what the impact of these changes are and what the people working in libraries would be. I think we're going to have a much bigger responsibility in continuing education than we have ever had in the past; in fact, I think that currently we do very little about this and that we should be planning for the future in offering educational opportunity.

Waters:

Thank you. Are there other reports at this time from the Official Listeners? Jan--

Miss Janice Kee, Office of Education:

I think from what I have to say, it will be obvious to you that Listeners listen from various vantage points. This is the listener who is neither fish nor fowl--sort of an in-between kind of person who is not a reference librarian with all the frustrations of trying to make interlibrary loan transactions work and work well, and not a person at the policy level or administrative level who is trying to hammer out some policies and procedures to make networking work, a person with absolutely no expertise in technology and making networking work. So, from what point do I listen?

I've been listening today in terms of my responsibility in this part of the country, and this is to look at how well--at least to what extent--we are planning and coordinating our efforts. And even if I comment just on the immediate past session, what I heard, it seems to me, is that we have a real network consciousness in Texas. We're interested--we are not only interested--we are engaged. We're--some of us--some of the people--some of the librarians in Texas are in it up to their necks and maybe over their heads. We are trying to learn to swim without, in some cases, having really good lessons in swimming. If I put myself in a role-playing position and play like I'm a librarian in Texas, I think I can take great comfort in knowing that we have going on in the state two approaches--at least two--the scientific approach, as was demonstrated by the efforts of Dr. Nance and the objectives of the Dallas Pilot project, and at the same time a real operation such as the R.I.C.E. project where we're actually trying to make it work.

I'm glad that we are doing both things. I do want to urge that we give a great deal of serious consideration to practicing what I've heard suggested a number of times--and far be it from me to say that all of the administrators of the networks in Texas should get together for a beer bust, but it might be a very good thing once in a while if we sat around the same table and hammered out some policies and procedures to see what we can do in the great big complicated State of Texas where networks are flourishing all over the place.

Waters:

I'll drink to that. Any other Listener reports at this time? All right, we're going to have a little working session here now. Take your Twenty Questions pink sheet. Will you please write out an answer to Question 1--a consensus of that table--and so on down the line. I'm going to give you ten minutes to do this, and then we're going to quickly record your answers to these questions, and then recall that individually we'd like to answer these too. So my watch says ten and a half minutes until four. At four o'clock we'll start getting answers to these twenty questions.

WORKING PERIOD

Waters:

All right, here we go. We've got Node 1 ready with Question 1, "Does your node want to join a network?" Would you give your name and identify your node, please.

Yvonne Greear, Node 1, El Paso Major Resource Center:

We have two answers. One is a facetious one. If we said "No," we're afraid it would stop everybody up. Now for our serious answer, because it would be impossible for even one system to serve adequately the informational needs of the area, and despite the presently exhibited disadvantages, we would find it desirable to join a network.

Waters:

Thank you. Node 2, are you ready to answer Question 2, "Which network do you wish to join and why?"

Lynn Benton, Deer Park Public Library, Node 2:

Let me preface our decision with the information that at the Law Libraries table, there's not a law librarian, so forgive us if we fail to think exactly as law librarians. Now, on first perusal of the question, it would seem logical that perhaps we would prefer to join a homogeneous network because, being a special library, we might assume that our inability to answer a question would come from lack of depth in our collection. However, our second thoughts on the matter brought us to the conclusion that legal questions impinge on all aspects of everyday living, and so, I presume that we are able to select only one type of network, is that correct?

Duggan:

No, you're not limited.

Benton:

Of course, we thought we wanted all types.

Duggan:

Would you like to serve as a resource center for the other nodes in other networks?

Benton:

Well, that's possible. Yes. But we would also--well, I beg your pardon--

Waters:

Would you like to poll your delegation?

Benton:

Yeah, thanks. He gave me the best idea--to go back and poll my delegation! We were thinking more in terms of getting than giving!

Duggan:

That's called node-network relationship.

Benton:

So we wanted all sources available to us, but of course we realize that if you get, you must give, and if we could select only one type of network then we decided that the heterogeneous network which gave us all types--now, let's see, it was heterogeneous vertical, is that right?--gave us more--a broader expanse of types of libraries to which we could go.

Waters:

Thank you. Janice--Question 16, "What patron group will you serve (a) as a requesting node and (b) as a receiving node? Are you going to emphasize Patron Mobility or Material Mobility?"

Janice Gohmert, Fort Worth Public, Node 16:

What patron group will we serve as a requesting node? We got specific. We would serve all members of the community who were not the primary public of any other type of library; for instance, speaking as a public librarian, I would not go overboard to serve a school library because we would supplement their primary function. On the other side of the coin, we would be extremely generous, and on (b) as the receiving node, we would serve all requests sent to us, assuming that the reference librarian who sent the question to our library would have sent it to the correct spot. Are we going to emphasize--it took us 10 minutes to define patrol mobility (as listed in the sheet), and then we found out it was "patron."

Duggan:

You see what happens when you get a typographical error in the teletype message?

Gohmert:

I had trouble with "interfere" too and "interface." My notes: the patron mobility would be limited to local material when we were the requesting node. For local patrons we would say, if the local patron is there--the local material is there--we would send the patron to the material. If we have exhausted our resources in our area, then we would try to get the material to the patron. In this instance we would send a request to another library and hope they would send the material, rather than moving the patron.

Waters:

Thank you. Harold--here's Question 17, "What role specialization do you visualize for (a) your node and (b) other nodes in the network and (c) the switching center (if there is one)?

Harold Richardson, Node 17:

Speaking for the special librarians--first we had to try that age-old problem of defining a special library, and we defined it as "a library not public, not academic, and not school, generally privately owned." Our consensus was that, subject to management's approval, the special libraries would act as a relay; they would offer specialized reference within their areas of competence; they would loan highly specialized material that was not otherwise available in the area, but only to those people with a real need to know.

Waters:

Thank you. Frieda--Question 11, "What geographic configuration do you wish in the network? Will it mix governmental units?"

Frieda Sheel, Rosenberg Library, Node 11:

From the standpoint of Abilene, it needs to be at least a regional, West Texas, or preferably statewide. We had trouble defining what was meant by "mixing governmental units," city, county, state, or is this types of libraries? Well, the general consensus was that a network going through the public library system first, then a network which would permit us to go to university and/or special libraries, whether this would first be done on a regional basis would depend on the type of question, how fast you need the material, whether you go to Abilene Christian College for material or go to the State Library. If you need it immediately, then you'd probably have to go to Abilene Christian for something that's needed that day. But, preferably go through the network, primarily from the standpoint that most of the college librarians feel like, well, they're busy--I can't speak for them, we had some at the table, but they're busy enough with the college problems without handling things that could be handled by the public library.

Waters:

Thank you. Mickey--Question 3, "What type of node/network relationship do you wish?"

Boyvey, Node 3:

I'm speaking for the school libraries, so schools are structured from the local campus unit to the district to the regional center to the state. So far, the regional centers have provided primarily films, because they have been in operation only one year. Now these are jointly funded by local funds and by the state level. Let me say now, the regional media centers or the education service centers have all the powers of a local district except taxing powers. This means that they are in a position to effect contracts. We have been approached by small public libraries to borrow films. We hope that services will expand to include books and many other types of media, but mandated under the law was, of course, the circulating film library which had to be started immediately. It seems to me there are some possibilities that we could work out from interfacing at the district--or at the regional level. Most of this so far has remained in the schools and is an up and down flow through schools. We'd like to learn the rules of the game, though; we want to play!

Waters:

Let's move to this side now, please--Question 4, "What type of services or resources do you expect to get from the network? What selectivity criteria?"

Beth Hall, Haltom City Library speaking for Node 4, Amarillo MRC:

I would expect an expansion of what we do, actually, in our own library. We're kind of a middle man, so to speak; we are an area library. Backing up and speaking from the small library, I would say that they would expect from us any materials that we might be able to furnish from our collection first. And then if we did not have it, they would expect to go on to the MRC which is Fort Worth. We would expect in this area going on as a Size 2 library the materials that we couldn't find in our library, besides things that possibly we could not afford in our library, being a smaller place. For example, we haven't made requests yet--but we may someday want transparencies, films, and we would especially like to ask for copying materials of things that could not be checked out from the MRC. Now, if they don't have the material, then we would expect from them to go to the Texas State Library or any source where the material is available. And in the second part of the question, "What selectivity criteria?"--Well, I don't think I read this question in the first place. It says, "What type of services or resources would you expect to get from the network and what selectivity criteria?" I think that they would expect from us to certainly try to give them a source like BIP or maybe Wilson Catalog, or anything that we had in our library that we could give them as criteria, or-- and we would expect them to use whatever they have at their hands to pass on to get the book for us.

Waters:

Thank you. Shula--

Schwartz:

Well, I'm representing Node 19, which is the Industrial Information Services-TAGER Network, and we sat here and tried to answer all these questions and after I got up here I decided that that was really foolish, because we have the Director of I.I S. sitting right up there and I think she ought to answer her own question! (Laughter) Because none of us are part of I.I.S. except as possibly members.

Duggan:

Question 19, "Do you visualize any node/network conflict in goals? If such were to occur, how would you resolve the conflict--(a) leave the network, (b) try to modify the network goals, (c) modify your node's goals?" was designed to illustrate something that Dr. Nance mentioned and some of the things that you all have talked about today in looking at the cases. There will come a time in networks when there will be a conflict between the interest of the node and the interest of the network, and I think this is one thing that when the network is being organized--you've got to consider this and have a policy in your own mind of which takes priority--the node or the network? This is just to raise the question and to do some thinking about it. You could get mad in a huff and pull out of the network, you see? Then what happens? Or, if you have a vehicle for expressing this conflict--a committee or an advisory council or a board, then you can try to modify the goals of the network to resolve the conflict, or you may have to modify your own node's goals. Some of the libraries who are trying to be all things to all people may have to reshape and rethink their own policies and their own goals.

Schwartz:

We agreed--we all said what you said--but I would like to take it a a step further. There are definitely going to be conflicts in the fact that Industrial Information Services-TAGER is a network of some sort already, so there can be conflict. There is a possibility--and I hope Maryann will correct me if I'm wrong--that there might be legal questions raised in the possibility there is a conflict, such as how it's funded and who it's supposed to serve. If a conflict comes in tying in with a network--not as a receiver but as a giver--would you be restricted in who you may serve for this network? So, all these possibilities are there, even to the extent of having to leave the network. I hope I'm not incorrect--

Duggan:

Right, these are just here to give us a spark to think.

Unidentified Person:

Our question was Number 7--can you hear me? Our question was Number 7: "What type of network organization do you prefer, directed or undirected?" Since most of the libraries in the Lubbock MRC node are rather small libraries, we had two points of view. Because of our small collections, we would prefer, of course, undirected systems, so that we felt that we could at least write to where we thought the source was. But we realized that ultimately about three libraries would receive the majority of our requests, which would happen probably statewide. So we believe that a more realistic approach would be to suggest a directed network, for the simple reason it would encourage smaller libraries such as ours to build locally, to have the things they should have, to emphasize the need perhaps for statewide bibliographic development on many levels. We feel this way the load would be shared and the resources throughout the state would be utilized to their fullest extent. However, the patron might suffer in terms of how quickly he might receive the answers to his questions or books that he might need.

Waters:

Thank you. Let's move over here now, please to Node 15, with the question, "How will you evaluate the network performance? What criteria are important to your node? To the total network?"

Gertrude Thatcher, University of Corpus Christi, Node 15:

Well, we felt we'd evaluate it as a node from the number of "successes" as against the number of "failures" in getting requests filled. "What criteria are important?" We thought the number of successful fulfillments, the time involved in getting these fulfillments, and the cost per request, and we felt that these, too, were the criteria for the whole network.

Waters:

Thank you. Let's move back on to my left now, please to Node 12, with Question 12, "Do you plan to "switch" requests locally? In the MRC area? At the state level? Where and how should your node interface with other networks?"

Meris Eggert, Texas Southern University, Node 12:

Well, being a state university library, yes, we would plan to switch requests locally, and in the MRC area, and at the state level if requested. I think that as an interlibrary loan request, our service as a state library would be more for receiving requests from other incoming sources since we're going to be sending out interlibrary loans for faculty members and graduate students, and all of our other things, I guess, would be requests to the public library, if it's a student asking for a request, since we wouldn't do interlibrary loans for a student, if we didn't have the information, he would have to seek it on his own.

Waters:

And now for Node 17, your question is "What role specialization do you visualize for (a) your node and (b) other nodes in the network, and (c) the switching center (if there is one)?"

Marjorie Atkinson, La Retama Public Library, Corpus Christi, Node 17:

Our group is a member of the Texas State Library Network, and it a hierarchy of libraries, and therefore in role specialization, I'll start with the lower and work up to the State Library itself. The lower libraries--basically their role is to screen requests and to communicate them to the higher level once it's determined that they cannot be filled at the lower level. And then our role is more or less the central one. We receive requests. We also initiate requests from our own users, and then we verify requests before forwarding in the referral service. And then the switching center would be the State Library as the coordinator of the system, switching requests among the 10 major resource centers. They also serve as a lender in the system, but that wouldn't be in their capacity as the switching center.

Duggan:

Would you want a node in the total network that had a specialized role like the law libraries or like the technical information center like R.I.C.E., or like a film media center?

Atkinson:

Well, we would like to be associated, I think with--have access to another network such as this. But in the network as it is now set up, these are the roles that we fulfill, and it would be nice to have access to the other.

Waters:

All right, let's come back to this side now to Node 8, and your question is "By what legal authority can you join a network? What type of formal agreement do you visualize? Who must approve contractual agreements?"

Jim Platz, Associate Librarian, Texas Tech, representing Node 8:

I was asked to join Node 8 because I'm from Lubbock and there's a rumor that W.I.N. will be located there, and they didn't know anything about W.I.N. and I didn't either, so they thought I'd be eligible. It was decided by the table--the node--that we would choose the public library, and I'm not sure we are correct in doing this, but it said "a network," and I admit this is a case of "the blind leading the blind" if there ever was a case. We decided the public library is governed by the Lubbock City-County Library, by the County Commissioners and the Mayor, and the City Commissioners. That is the legal authority. What type of formal agreement do we visualize? We decided that it would be a contract. Who must approve contractual agreements? We again pulled it out of the hat--out of the air--and decided it would be the library administration plus this governing board of the commissioners. Now, if this is not the answer needed by you people for Question 8, it would be connected with W.I.N., then there is a rumor that W.I.N. would be run through Texas Tech, the governing board of that institution would then be the contractual party and the library administration and the governing board--the board of directors would be the contractual party. I hope that answers this question.

Duggan:

Suppose someone in the Corpus Christi area wanted to join W.I.N.?

Platz:

I would assume they could join because I understand it's west--

Waters:

Oh, W.I.N. consists, as we said earlier, of 18 colleges and junior colleges in West and Northwest Texas. It has a board of directors. It's created by state legislation, House Bill 692. It is headquartered in Lubbock. I don't believe it's at the Texas Technological College; I think it's somewhere else in the city. It has not performed any services to date, but it has grand plans.

Platz:

I'm informed. I thank you.

Waters:

All right, let's move over here now with the question for Node 18, "How will network participation influence your own library policies and procedures on (a) book selection, (b) acquisition, (c) cataloging, (d) retention of material, (e) automation of technical processes and/or circulation systems?"

Jean Collier, Houston Academy of Medicine of the Texas Medical Center:

I represent Node 18, the Health-Science Libraries. Are you speaking of any network participation or a particular network participation?

Duggan:

Just any network.

Collier:

All right. Well, we do belong to a Texas Council for Health-Science Libraries, and we have made application for a decentralized South Central Regional Medical Library. Now this participation would influence our library policies and procedures. On book selection, you will probably end up with a subject specialty. In acquisitions, there will be a cooperative major acquisitions program. The cataloging should be compatible; the classification undoubtedly will want to be NLM; the retention of materials will be the large medical research libraries. For example, the small hospital libraries will not be able to retain long back files of journals, and the major ten resource libraries will; and automation of processes is in the wind. It's coming, and also the automation of circulation systems undoubtedly will be effected.

Waters:

Ann, how about Question 14?

Ann Bowden, Austin Public Library, Node 14, Austin MRC:

My question is: "How will you train your staff to use the network capabilities?" We felt that the only solution was constant staff development using detailed procedural manuals and workshops--workshops both at the network level and at the local level. The procedural manuals and the workshops should be constantly updated. In the interest of serving our patrons most expeditiously, we felt that the staff should have a thorough knowledge of all local facilities, both library and non-library, and that this, in turn, would prevent unnecessary questions from reaching the network. Of course, Austin is a unique situation, but we prefer the horizontal network to the vertical.

Waters:

Thank you. Next is Node 6, and the question is "What B/L ratio do you anticipate for your node? What total B + L? "

Ann Hanson, Brazosport Junior College:

Our question has to do with the borrowing/lending ratio that we anticipate in our node. At this time, I believe we would anticipate a 90 per cent borrowing and a 10 per cent lending ratio. Now we feel like this is what it would be unless junior colleges form some kind of cooperative effort within themselves to borrow and lend.

Waters:

Thank you. Next please is Node 9, with the question "Who will pay for the network operation? On what basis are allocation of costs among the network members determined?"

Louise Hamilton, Brooks County Public Library, Falfurrias, Node 9:

We're answering our question--attempting to--from the view of a major resource center since our table states San Antonio Major Resource Center, although no one at our table represents a major resource center. The question is: "Who will pay for the network operation?" And our decision was that we might visualize an imaginary sign such as we all see on our highways: "Your tax dollar is at work." This would be the manner in which this thing would be funded. Then the second question is" "On what basis are allocation of costs among the network members determined?" And here we thought--we remembered that in this session today we have not--no one seems to have been able to ascertain the cost of the present systems, and so we would really be unable to answer this, except that we believe it would be based upon the demands made upon the major resource center and the manner in which they meet these demands or the extent to which they meet them.

Waters:

Thank you. Let's move on this side, please, to Node 20, and the question, "What other factors do you think are important?"

Ginger Church, Student at G.S.L.S., University of Texas at Austin:

I just happen to be sitting at Table 20, Inter-University Council, and our suggestions of other factors that we thought were not covered in the questionnaire really consist of sort of a shadow network--I guess you'd say. It's the possibility of having review and evaluation sessions of representatives of the disparate kinds of libraries to gain an appreciation of each other's kind of collections and needs and an awareness of the alternate networks other than just the ones that they may be legally prescribed to be in.

Duggan:

Very good.

Waters:

Thank you. Mr. McElderry, Node 13's question is "Who will work out the operating policies and procedures for the network and the node/network 'rules of the game?'"

McElderry, Node 13:

We take the long view of this question and feel that it is basically a national problem. There is some initial advantage to be gained through local networks as described here today. We think this provides a basis for enlarging the scope of the resources available, and we think that a fruitful starting point would be to base evaluation and building of resources on established bibliographic tools; something on the order of the Winchell Checklist mentioned this morning. But in the long run, to realize the full potential of information transfer, we feel that this problem has to be handled on a national basis. So we foresee a federal agency of some type (growing out of the permanent National Library Commission) which would contract research projects, develop task force approaches to the problem, conduct pilot studies that are carefully monitored to develop a suitable overall national pattern. The reasons why this seems the best long term approach is that we need the expansibility that comes from compatibility between local, regional, state networks. We think the cost and the talent required to develop an adequate network is something more than smaller networks are in a position to provide; that the basic technology required to develop full potential here utilizing computers, microtechnology and other mechanical devices are basically expensive. They require a broad national market to be developed, and this can't be done by building up networks on incremental local bases. Further, we feel that we will not in one fell swoop design the ultimate network; that it will be a continuing problem requiring study and refinement, and that this can only be done economically and efficiently on a national basis.

Waters:

Thank you. Now I know it's getting late. We ask about 20 more minutes of your time. Francine--

Morris:

You forgot Node 10, with the question, "What 'communication channel' do you plan to use? How much will it cost per month? Per message? What message load do you anticipate? What turn-around time? What channel capacity do you need?"

Node 10 is a switching center, and since nobody is quite sure what a "switching center" is, we hypothesized--I think is the word--a marvelous switching center to take care of all the other nodes. We will require a multi-channel capability of TWX, teletype, telephones, television, the whole works. The cost, both per month and per message, will be prorated on the basis of capital outlay, the cost to the initiator and our overhead. The message load will be variable, the turn-around time minimal, and channel capacity unlimited‼

Waters:

I think we just designed our ideal model network.

Well, we realize that these were really springing a lot on you to grapple with these right now and, as we said, there are no perfect answers, but we think the responses we have here, when we get all this put down in black and white, will be important and make interesting reading. Did you have a question, Mr. Wagner?

Wagner:

I'd like to make some supplemental comments on Miss Church's remarks. I feel that over all today we've discussed far more about mechanics than we probably should have. In my opinion, and I feel my opinion is as good as the next person's, probably better, there are interpersonal psychological problems involved that throw into considerable shadow some of the problems of financial matters, legal matters, mechanical matters of making computer systems and switching networks work. I think that these problems have to be solved by personal contact between people that actually do the work rather than head librarians who merely make decisions. I think they have to get together and become acquainted with one another on a personal basis over a continuing period of time. A very valuable service that the Texas Library Association can offer is to make sure that they do get together over a continuing period of time. I'd like to see it more widespread and more definitely applied to people that are in information networks and are concerned with this sort of problem.

The other matter is that many of these information services or networks are based on data banks that are in atrocious condition. I'd like to point out, for example, the microfilms of U. S. patents that are put out by the U. S. Patent Office. Those microfilms conform to the bare requirements of the G.S.A. microfilm quality specifications, so that if you have a very good reader and it's in perfect focus, you sometimes can make out what it says.

Waters:

Yes, I think you're pointing out a problem that all of us here realize and one of the many problems that will come to the surface--or already have surfaced in designing a network.

"The Future-Where Do We Go From Here?"--this is to be the final report from the Official Listeners, and I'll ask now for that report. I'm not sure who is to make it. Don't everybody jump up at once. Heartsill, would you like to have the honor?

Duggan:

Maybe Maxine--

Waters:

All right. Let's have a caucus of Listeners and let's skip down just a moment to the Reference Round Table plans for the future, which is a clever or unclever way of saying "We have to have a short business meeting of the Reference Round Table." Would our chairman please approach the platform? You all have copies of the minutes, so we won't have to read them, thank God!

Johnston:

You think you've got problems? You're cold. You don't know why you're at the table that you're at. And you've got an awful lot of paper that you're not sure what you're supposed to do with, and you've got to fill a good deal of it in and turn it in at the door as you leave. But I've got more problems. I have become lacking in gorgeousness during the day because of other things in the room. I've torn stockings on chairs and dropped coffee all over me, and assorted other ills I can complain of, including the fact that Miss Duggan, Mr. Waters and Mr. Perrine seem to have shared their virus with me. My throat is beginning to bother me. All right, the business session of the Reference Round Table is now in order. We will not have any minutes read, because we have taken the precaution of printing them. They are on every table in the room. I trust you have read every glorious word and are there now any corrections or additions to these minutes? If not, we will approve them as printed in the mimeographed form.

We will now have the treasurer's report. We have a secretary-treasurer, Carole Johnson, who has performed magnificent services for us in the last day or two--in the last few weeks, I should say. She will now report on the treasury.

Johnson:

Our balance before this Conference's intake and expenses was $362.13.

Johnston:

Carole, while you're at the microphone, suppose we also have your report on the registration.

Johnson:

The best we could figure out, 288 people registered, but 256 are present. All right. Three committees which have been much in evidence today--we will not ask reports from: The Planning Committee chaired by Richard Waters; the Model Network Committee chaired by Maryann Duggan; and the Local Arrangements Committee, chaired by Ruby Weaver. Obviously, you have been enjoying their work and getting a report on it all day long. For the record, Richard Waters was aided by Janice Gohmert and 10 Major Resource Center coordinators. Miss Duggan had a large committee of about 20 people, and we will not bother to enumerate those, but they too have served nobly and contributed their services to this project; and of course, Ruby Weaver's feet should be soaking by now, because she's made many a mile in our behalf, and we would like also to thank Jean Taylor, Jeff Caskey, and Parker Williams for their efforts in our behalf on local arrangements.

I would like now, if possible, to have a report from the Steering Committee, chaired by Richard Perrine, and composed of Sarah Aull, Maryann Duggan, Richard Waters and Janice Gohmert.

Perrine:

Well, this Steering Committee has the skeleton of a resolution. Maryann, do you still have that?

Duggan:

(Inaudible comment).

Perrine:

We do want to recommend on-going action--

Johnston:

Would you like to have another minute and let me go on to another committee? All right, we'll move on to the next committee and let Dick and Maryann have a minute to find their resolution. All right, may we now have the report of the Nominating Committee, Julie Bichteler, Chairman?

Bichteler:

The report of the Nominating Committee is "for Chairman Elect, Maryann Duggan, Director, I.I.S., Dallas, Texas; for Secretary, Nancy McAdams, Architectural Librarian, University of Texas at Austin. Respectfully submitted, Albert Bradley, Marguerite Clayton, and Julie Bichteler."

Johnston:

As you know, last year you elected Janice Gohmert to be Vice Chairman-Chairman Elect, and we would like at this time to have Janice Gohmert pointed out to you if you haven't already heard her at the microphone a couple of times today. You may not have known that she is your Chairman for the coming year. Janice, would you stand up and let everybody see you? And now, according to protocol, we have to have an opportunity for ominations from the floor. Are there any nominations from the floor for the office of Vice Chairman? Are there any nominations from the floor for the office of Secretary-Treasurer? Julie, would you care to move that this slate be nominated by acclamation? Is there a second? Now a question--all opposed--I mean, all in favor, please say "Aye."

All:

Aye.

Johnston:

Anybody opposed? How dare you(??????)

Now I would like to have the report of the Publications Committee, please, and Nell Cunningham could not be with us, but she has given the report to Edith Grisham, a member of her committee.

Grisham:

"Printing was completed on the 1968 Reference Round Table Proceedings, and flyers with order coupons were included in the pre-Conference material, which was mailed to all Reference Round Table members, as well as all other interested libraries. In March 150 copies were received from the publisher and the committee began filling orders. Before the start of the conference, 73 copies had been sold. A table was set up at the conference and 27 copies were sold. One thousand order coupons will be placed in the TLA booth, as well as extra copies of the Proceedings. Purchase orders and checks which have been received prior to publication were returned to the ordering libraries with cover letter and order coupons for the booklets at the new price of $1.50. Because some institutions have no provision for prepayment, invoices have been printed so these may be billed. If the unsold number warrants it, letters will be sent to out-of-state libraries which may be interested in purchasing. Respectfully submitted, Marjorie Wheeler, Edith Grisham, Nell Cunningham, Chairman."

Based on this report, I would like to submit the following motion: "That the Proceedings of the Pre-Conference Institute on Cooperative Library Reference and Information Networks be published in full in the Spring 1969 issue of the Texas Library Journal; that if the Texas Library Journal cannot publish said Proceedings in full in said issue, the Reference Round Table of the Texas Library Association seek and receive permission from the Executive Board of the Association to publish said Proceedings itself on a self-liquidating basis."

Johnston:

The motion has been made. Is there a second?

Adelle Durden, Houston Public Library:

I'd like to second this motion.

Johnston:

Is there any discussion of this motion? Any comment?

Unidentified Person:

As Chairman of the Publications Committee, I'm afraid that it would be out of the question for the Journal to publish the Proceedings in full.

Waters:

I'd like also to make a comment. I'm sorry that this was not transferred to the Publications Committee, but the Texas Library Journal editor has already asked for and received some acknowledgment of publishing selected papers and proceedings in the Summer issue of Texas Library Journal. I would wonder if the Committee would want to withdraw their motion?

Johnston:

We assume that if any problems developed in getting them published that you might want the option. If not, I'm sure Mrs. Grisham would be willing to withdraw the motion. Do you want it withdrawn?

Waters:

I think it should be withdrawn or amended. It's impossible--there's no way they can do it in the Spring issue. They're already set up for what they're going to print in the Spring issue.

Johnston:

That was a misunderstanding that I conveyed to them. I thought you said Spring issue and you said Summer. She can amend her motion if that's all right. Yes, she can amend her motion to Summer '69 instead of Spring--

Waters:

And perhaps substitute "selected" instead of "in full."

Johnston:

Do you accept Mr. Waters' amendment to the motion--I assume that this is an amendment?

Waters:

Yes, I would make an a--a motion--or an amendment to the motion that we substitute Summer issue for Spring issue, and instead of "in full," "selected" or "a portion of" the Proceedings.

Johnston:

Do you accept these amendments? All right, then we don't have to vote on them.

Is there further discussion? If not, let's have the question, all in favor, "Aye", please. Those opposed? (Silence). Then we assume the motion passes.

That completes the committee reports, with the exception of one committee, the Publicity Committee, chaired by Carrie Eagan, and also with Harold Richardson serving, and I'm sure that their work will be in evidence soon in Flash and in other places, so we will not call on that committee for a report. Is there any unfinished business? Well, wait a minute, let's go back and see if Dick Perrine's ready for his committee report.

Perrine:

The Steering Committee wanted to assure that some of the Proceedings were published. This is one thing we've just discussed. The Steering Committee also feels that a permanent stateiwde network study group should be formed, with representation from five different groups: from each of the MRC's, from the Title III Advisory Council, from the Library Development Committee, from the Texas--T.E.A.--what is it?

Boyvey:

Texas Education Agency.

Perrine:

--also from the State Library and from the Coordinating Board, and with representation also from each existing operating network. The Steering Committee would also like to recommend that the Reference Round Table seek ways and means to contrive the analysis and designs of networks, with the ideal of specific implementation steps and cost figures to be presented at the Reference Round Table meeting in April of 1970.

Johnston:

Is this in the form of a motion, Dick? That this proposal be adopted? All right, Mr. Perrine has moved that this proposal be adopted. Would you repeat the motion?

Perrine:

To form a permanent statewide network study group with wide representation, which I will not enumerate, to seek ways and means to contrive the analysis and design of networks, the ideal network, with specific implementation steps and cost figures to be presented at the next Reference Round Table meeting in 1970.

Johnston:

Mr. Perrine has moved that this proposal be adopted. Mr. Waters has seconded. Is there anyone who would like to discuss it? Miss Kee--

Kee:

I'd like to ask him if "wide representation" includes the Advisory Council members of the Title III Interlibrary Cooperation Program?

Perrine:

Yes, that was the second one mentioned.

Johnston:

Is there further discussion? Or questions? Then may be have the question, all in favor of the motion, please say "Aye."

All:

Aye.

Johnston:

All opposed, "No." The motion is carried. That completes committee reports. Is there any unfinished business that anyone is aware of to come before the meeting? Is there any new business? Then there is one announcement that I have been asked to make room for, and I would very much like to have Mr. Richardson to go to a microphone right now for an announcement about The Texas List.

Richardson:

Dick Waters stole part of my thunder this morning in his speech. I don't know who had really tipped him off semi-officially. It is now the announced plan of The Texas List that the 1971 edition will contain the Social Sciences, the Humanities, and the Fine Arts, and thus round out all of the serial holdings in the State of Texas. Obviously, there will be an increase in price.

Johnston:

Now that is all of the announcements that I know about. Does anyone else have one? Then I believe Roberts' Rules of Order says that I need a move of adjournment of the business session, but not of the conference in progress, because we still have some Listeners to hear from. So may I hear a move for adjournment of the business session?

Mrs. Clayton moved and I'm sure somebody seconded. All right, the business session is adjourned.

Waters:

Before we have the Listener's report, we have our very distinguished Texas Library Association President with us, Mr. Sam Whitten, who would like to make an announcement.

Whitten:

I'm not going to make a speech--don't panic! I have been very pleased with what I heard here and I wish I could have heard the rest of your meeting. I think we'll have to find some way to get these Proceedings published, because you people seem to have acquired the vocabulary today, and the rest of us are going to have to read what happened here or we won't be able to communicate with you.

Waters:

Thank you, Sam. Now are we ready for the final report from the Listeners? Jan Kee--

Kee:

Let me make it clear that I may not be the only Listener who will wish to speak, although I was asked to speak first. I think the reason I asked Dick Perrine to reread the recommendations or the proposal is that he has been a good listener himself from our point of view; he has heard what we consider to be some of the needs for the next steps, and that is the establishment of an on-going study or survey or group to continue the examination of the potentials and possibilities for networking in Texas. I think it's quite obvious today to anyone who is here, even though you've been busy participating and not charged with full-time listening, that there are many, many unanswered questions on procedure, on--really the nitty gritty procedure of how we can do it--on policy that would give us some kind of uniformity, so that we'd all be aiming at the same general goal; and also a very important question of "who pays", and I would like to emphasize the importance of carrying along quite careful consideration of the source of funds.

"Where is the money coming from?" is a very good question that you'll be facing with governing bodies, with legislators, and alas--with Congressmen. If I have been tuned in today, I've heard many references to the source--to the federal government as an important source of funds in carrying on the programs that are now in progress. The State Technical Services Act, the Library Services and Construction Act, the Medical Library Assistance Act, the Higher Education Act, the National Science Foundation source of funds, the Bureau of Research; there is a tremendous potential of using these funds and a very important business of coordinating and planning the very best use of them. We can't do this unless we get together. Again and again I heard you talk about the importance of simply getting acquainted on a personal basis. Now, not that I think we can organize networks on a personal basis, but there is a certain--as was pointed out--impersonal relationship that is absolutely necessary--we've got to get over some of the psychological, traditional operational barriers which sometimes can be broken down if we're good friends and understand that all of us are trying to get to the same mountaintop.

So I'm glad to know that you have adopted the proposal of continuing the study. If I might just say one more thing, somebody slipped in the suggestion that maybe we should give some attention to the model Interlibrary Loan Code. For a long time I personally--and I am sure there are others with me--who have been concerned about the junior college, the growing junior college library, and nobody here today has mentioned the area of the vocational school and the tremendous amount of vocational training that's going to be taking place in all parts of this country. These students are, from my point of view, a bit out in the cold, when it comes to the present network structuring in this state and other states. And there are a lot of us who are worrying about this, and I hope that we give some careful attention to a national suggestion--and by the way I was interested in Dean McElderry's taking the long view and saying many of our problems are going to be ironed out at the national level. And I'm glad he said that and I didn't, but I do think that the nation has spoken to us. The Interlibrary Loan Committee that revised the Interlibrary Loan Code has spoken to us on a very important matter. They've said the Interlibrary Loan Code is too restrictive for many library users, and each state might adapt this model code. Now the model code is around--it's been sent to the State Library; it's been sent to Heartsill Young; there are a lot of people who have it; and I think it needs attention. I hope the

Reference Section will take this up and work on that.

To again summarize, I think we have many problems--many unanswered questions about networking--this conference has been a brush-over--not lightly and yet lightly--of many, many questions that have to be answered. I hope that everybody here will go home and ponder these as good fodder for the mill at staff meetings, board and administrative meetings, district meetings, and, as somebody suggested, beer drinking parties. Thank you.

Waters:

Thank you, Jan. Are there other Listeners who would like to comment at this time?

Well, when we started planning this program, we said we wanted to be through by five o'clock, not because it's five or a minute or two before or after; but we thought we wanted to get out of here by five. And by gosh, we're going to make it, just about. We want to thank all of you who have come today, not only Reference Round Table members, but many of the special librarians and school librarians who are not RRT members. We appreciate your interest; we need your help; we're all in the same game, and the name of the game is "better library service to all citizens of Texas." We'll see you later on in this conference, or sometime later on during the year, if not next year in Amarillo. Good day.

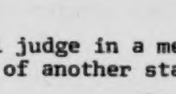
C.6-b

ANALYSIS OF BEHAVIORAL MODEL (NETWORKING GAME)

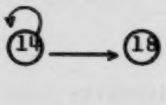
Interspersed with the formal papers and "official listeners" reactions, certain Real-Live Cases of Interlibrary Situations were put on the simulated network during the RRT Seminar. The network was set up in the room as explained in Appendix C.2; the cases are listed in Appendix C.3-g. The transcription of how the cases were actually handled in the Behavioral Model is reproduced in C.6-a and should be reviewed by the reader for full comprehension of the following analysis.

After one false start, a total of 11 cases were actually simulated. Each case is listed below and a symbolic model illustrates the starting node and the route of the case through the network. The numbers in the circles represent the node numbers as described on page C-29. The case numbers correspond to the numbers used for the cases at the RRT and do not reflect the sequence followed in the game playing which corresponds to the order in which the cases are listed below.

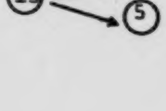
7. The local judge in a medium size town needs a copy of the statutes of another state.



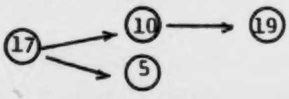
9. A small public library is asked by a high school student to get copies of articles on dope addiction from some medical journals.



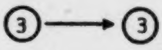
1. A small private university needs a copy of a technical report for a professor who is submitting a research contract proposal. (You are that university librarian.)



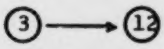
3. A small public library is requested by a local businessman to compile a bibliography on fuel cells, particularly articles with pictures.



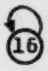
5. A teacher in a high school in a large city has asked the local building librarian for transparencies illustrating the circulation system of a frog.



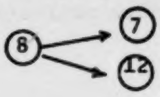
12. A teacher in a local elementary school asked the building librarian to get a copy of an article from an education journal on new teaching methods. The teacher is taking a credit course in education from a nearby state university.



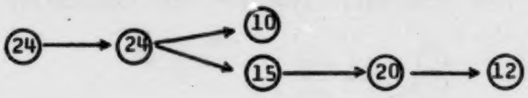
8. A local businessman needs recent census tract data on population statistics in another, larger city in the state.



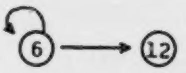
40. An employee of a business firm in the suburbs of a large city is taking a college course over closed circuit TV from a a distant state university. He needs a book. Where should he go?



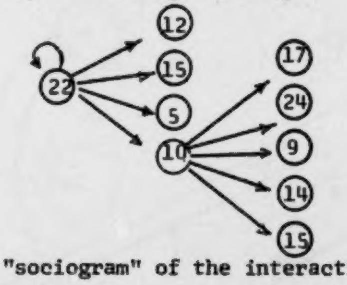
26. A professor from the local university asks the local branch library in a large city for a government document on lawn care.



35. The local housewife has asked the local junior college to use the French I language tapes to prepare for a trip to Europe.



30. A large public library has been asked by a local businessman to borrow a copy of an out-of-print American imprint on history of banking in Europe.



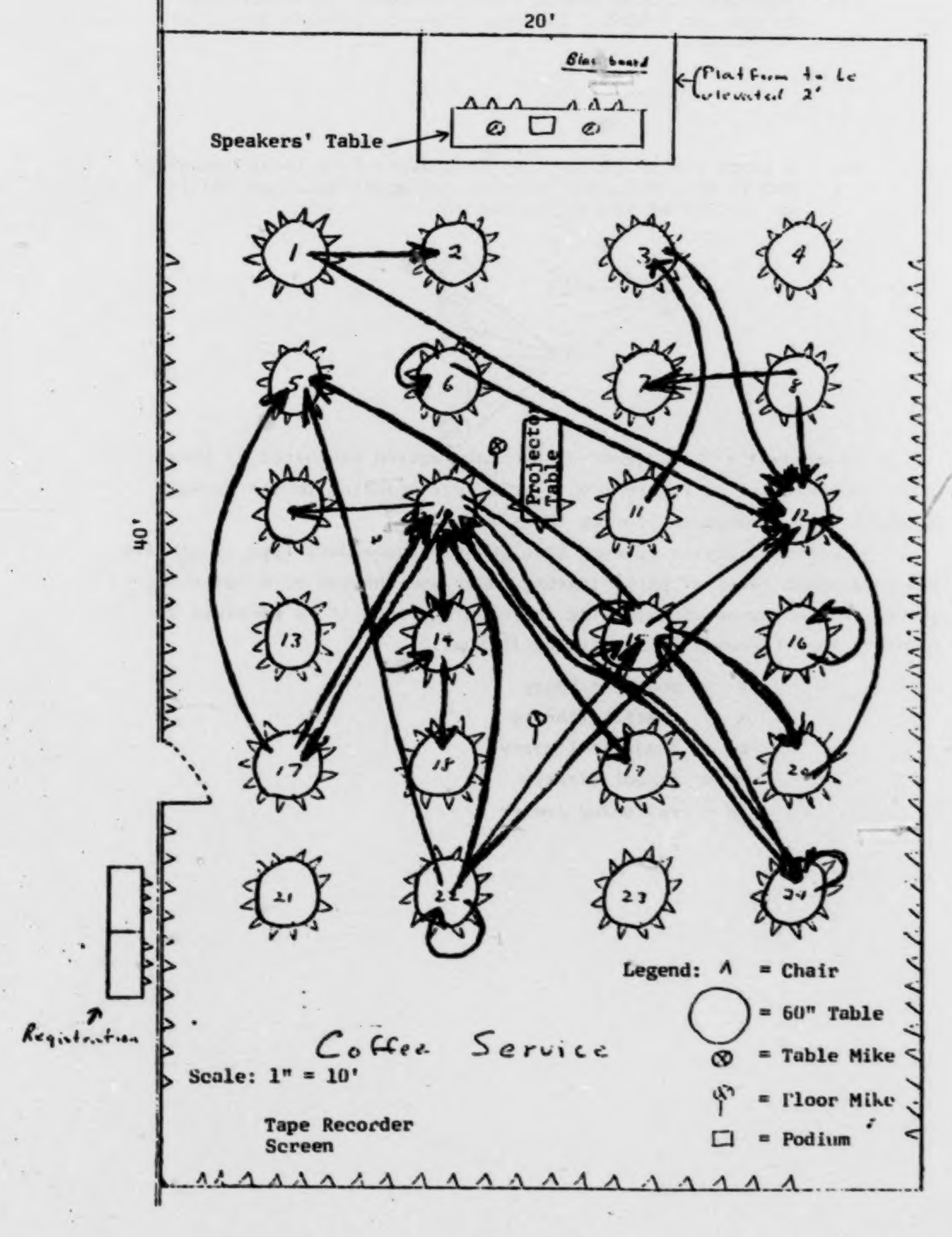
A composite "sociogram" of the interaction exhibited by these cases is presented in Figure 1 on a grid corresponding to the network physical room arrangement during the simulation.

Further analysis of each case behavior considers type of library and geographic level of participatory nodes and the use of a switching center in the transaction. Using a symbolic model, it is possible to identify each transaction linkage as follows:

P = public library
S = special library
A = academic library
PS = school library
SW = switching center

Figure 1. Composite Sociogram for Networking Cases

Room 114 layout for RRT Pre-conference.


20'
Blackboard
Platform to be elevated 2'
Speakers' Table
Projector Table
40'
1
2
3
4
5
6
7
8
11
12
13
14
15
16
17
18
19
20
21
22
23
24
Registration
Coffee Service
Scale: 1" = 10'
Tape Recorder
Screen
Legend: ʌ = Chair
= 60" Table
= Table Mike
= Floor Mike
= Podium

Geographically, the following subscripts are used:

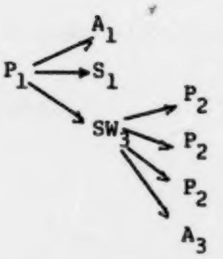
1 = local
2 = area
3 = state
4 = regional
5 = national
6 = international

Thus each of the simulated cases can be illustrated by the following transaction formula:

Case Number	Transaction Formula
7.	$\begin{tikzcd} P_1 \arrow[r] \arrow[dr] & S_3 \\ & A_3 \end{tikzcd}$
9.	$\begin{tikzcd} P_1 \arrow[r] & S_1 \end{tikzcd}$
1.	$\begin{tikzcd} & A_3 \\ A_1 \arrow[ur] \arrow[dr] & \\ & S_1 \end{tikzcd}$
3.	$\begin{tikzcd} & & SW_3 \arrow[r] & S_3 \\ P_1 \arrow[r] & P_2 \arrow[ur] \arrow[dr] & & \\ & & S_1 & \end{tikzcd}$
5.	$\begin{tikzcd} PS_1 \arrow[r] & PS_2 \end{tikzcd}$
12.	$\begin{tikzcd} PS_1 \arrow[r] & A_1 \end{tikzcd}$
8.	$\begin{tikzcd} P_1 \arrow[r] & P_1 \end{tikzcd}$
40.	$\begin{tikzcd} A_1 \arrow[r] \arrow[dr] & P_1 \\ & A_3 \end{tikzcd}$
26.	$\begin{tikzcd} & & SW_3 & & \\ P_1 \arrow[r] & P_2 \arrow[ur] \arrow[dr] & & & \\ & & A_1 \arrow[r] & SW_1 \arrow[r] & A_2 \end{tikzcd}$

35. $A_1 \longrightarrow A_3$

30.



The 11 cases involved a total of 27 transactions. Three of the 11 cases involved only one type of library* (Cases 5, 8, and 35); the remaining cases involved at least two types of libraries.** The combinations of types of mixes possible would be 25; 13 possible types of mixes were actually observed, as shown by the accompanying grid. Of the 27 transactions, 13 were "initiated" at a public library, six at academic, and two at school and six at switching centers. The academic libraries were "receivers" of nine transactions out of the 27; the public library received eight, and the special libraries received six. The most frequent transaction was public to special, i.e. P → S.

Initiator: / Receiver:	P	S	A	PS	SW	Total
P	3	4	3	0	3	13
S	0	0	0	0	0	0
A	1	1	3	0	1	6
PS	1	0	1	0	0	2
SW	3	1	2	0	0	6
Total	8	6	9	0	4	27

The following composite "sociogram" by type of library illustrates this observed intermixing as simulated in these 11 cases.

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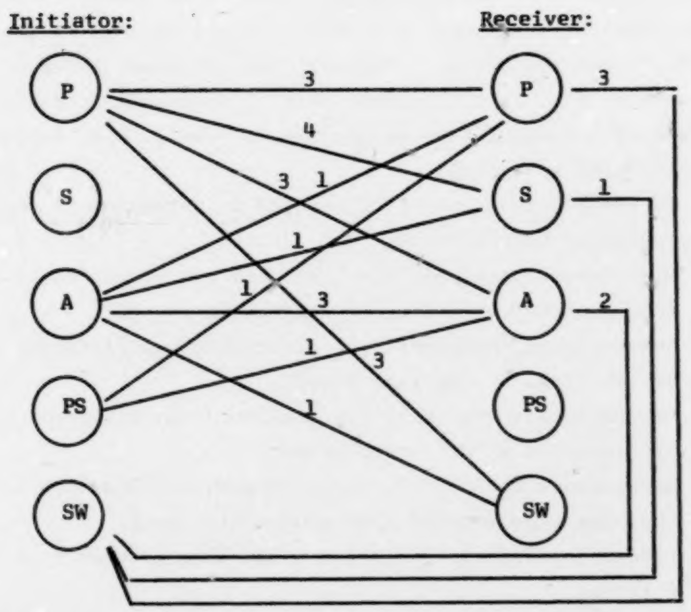
* Homogeneous transactions.

**Heterogeneous transactions.


Initiator:
Receiver:
P
S
A
PS
SW
P
S
A
PS
SW
3
4
3
1
1
1
3
1
3
1
3
1
2

The transaction links also exhibited parallel and series type transactions. Six of the 11 exhibited parallel strategy. Sequential transactions were involved in three of the 11 cases.

With regard to geographic level of the transactions, 36 combinations were possible. The cases demonstrated the following mix of geographic levels:

Initiator: \ Receiver:	1	2	3	4	5	6	Total
1	8	4	6	0	0	0	18
2	2	0	2	0	0	0	4
3	0	3	2	0	0	0	5
4	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0
Total	10	7	10	0	0	0	27

Of the possible 36 combinations, only seven were demonstrated by the simulated behavior. The most frequently occurring combination was 1 → 1, i.e. "local switching." The next most frequent level of switching was 1 → 3, i.e. local to state level. Seventeen of the 27 transactions involved switching between geographic levels, i.e. vertical as opposed to horizontal switching.

All of the transactions can be classified as belonging to the following four classes of transactions:

1. Homogeneous vertical, i.e., between two libraries of the same type but at different geographic levels;
2. Heterogeneous horizontal, i.e., between two different types of libraries at the same level;
3. Heterogeneous vertical, i.e., between two different types of libraries at different levels;
4. Homogeneous horizontal, i.e., between two libraries of the same type and the same geographic level.

The 27 transactions simulated in the networking game were in the four classes as follows:

	Class	Number	Percent
1.	Homogeneous Vertical	6	22
2.	Homogeneous Horizontal	1	4
3.	Heterogeneous Vertical	13	48
4.	Heterogeneous Horizontal	7	26
	Total	27	100

In other words, 48 percent of the transactions involved two types of libraries at different geographic levels. Only four percent of the transactions involved the same type of library at the same geographic level as compared to 26 percent involving different types of libraries at the same geographic level. Seventy-four percent of the transactions involved two types of libraries.

These data, although collected on a very limited sample, would seem to indicate the need for improved local switching among types of libraries in metropolitan areas and at the state level.

APPENDIX C.7
REPRINT OF TEXAS LIBRARY JOURNAL ARTICLE
OVERVIEW OF RRT INSTITUTE

Texas Library Journal

REPRINTED FROM
VOLUME 45 SUMMER 1969 NUMBER 2

The 1969 Reference Round Table Pre-Conference Institute:

An Overview

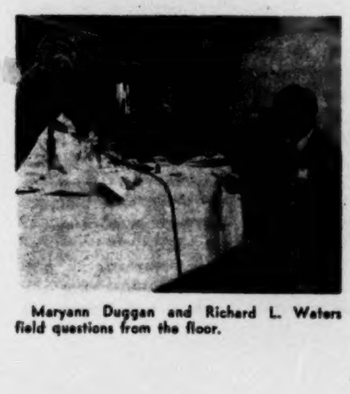
MARYANN DUGGAN
MAXINE JOHNSTON
RICHARD L. WATERS

A small public library is requested by a local businessman to compile a bibliography on fuel cells, particularly articles with pictures.

The fire chief of a medium size town has asked the state university library in the town to find copies of laws pertaining to labor unions for municipal employees.

A local lawyer in a small town has asked the State Library to compile a list of laws on accidental poisoning by error in filling a prescription.

A large public library has been asked by a local businessman to borrow a copy of an out-of-print American imprint on history of banking in Europe.



Maryann Duggan and Richard L. Waters field questions from the floor.

These situations are real; they occur every day in our libraries throughout the state. As long as they can be satisfactorily "answered" by the first library asked, then there is no problem. What happens, however, when the large public library does not have in its collection the out-of-print American imprint on the history of banking in Europe? But, we are getting ahead of our story. Let us back up to the origin of the four "real" questions.

The reference librarians of Texas engaged in a real-life simulated inter-library network on March 26, 1969, at the Third Annual Reference Round Table Pre-Conference Institute. Approximately 280 reference librarians were involved in analyzing inter-library cooperation and in brainstorming the design of an ideal statewide network. The Pre-Conference Institute was jointly sponsored by the TLA Reference Round Table and the Texas State Library with partial funding under Title III of the Library Services and Construction Act. The authors are indebted to the dozens of interested librarians who helped make this Reference

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Miss Duggan is Director, Industrial Information Services, at Southern Methodist University, Dallas, Texas.

Miss Johnston is Reference Librarian, Lamar State College of Technology, Beaumont, Texas.

Mr. Waters is Chief of Branch Services, Dallas Public Library.

Round Table Pre-Conference Institute a smashing success. The list of names of all the librarians who contributed is too long to publish at this time; however, particular appreciation and a debt of gratitude is acknowledged to Miss Carole Johnson, Hampton-Illinois Branch, Dallas Public Library; Richard Perrine, Reference Librarian, Rice University, Houston; Jim Stephens, Science and Engineering Librarian, Southern Methodist University, Dallas; Miss Janice Kee, Library Services Program Officer, U. S. Office of Education, Region 7, Dallas; and Heartsill Young, University of Texas at Austin. We are particularly grateful to the Texas State Library for partial funding of this experimental program. We also acknowledge the invaluable assistance of Miss Ruby Weaver of the Houston Public Library in handling the local arrangements for the Institute.

The Institute

The Institute had five objectives:

1. To summarize national, state, and local developments in cooperative reference and information service since the 1968 TLA Reference Round Table Institute.*
2. To explore new thinking and approaches to the examination and use of cooperative reference services and library networks.
3. To apply network concepts to local library situations.
4. To develop an ideal, statewide, inter-library reference network through participation of Institute attendees and Official Listeners.
5. To identify future developments needed in cooperative reference and inter-library networks in Texas.

In summary, it was our desire to come to grips with library networks, what they are, where they are, how to use them, and how might Texas benefit from them. The utopian goal for the Institute was to design an "ideal reference and information network" for Texas. As a step toward fulfilling these objectives, it was decided that the Institute participants and attendees might better understand, appreciate, and enjoy the day's activities if they were situated in a network atmosphere. Thus, the 282 registrants found themselves seated, not in conventional theatre seating, but rather around pre-labeled tables, 12 to a table. Each table was intended to represent one "node" in a network. The MRC's, special libraries, W.I.N. (Western Information Network), private colleges and universities, school libraries—these and other groupings each had a table of their own. One table was designated as the "Switching Center."

The Registrants

The 282 in attendance included 120 public librarians, 113 from colleges and universities, 30 special librarians, and 12 school librarians. The balance were students, trustees, friends, and sales representatives. Total involvement of all participants in the planning and design of an ideal statewide inter-library network was the intent of the program. By being assigned by nodes, and by simulating real-life library situations in coping with the problems assigned in each node, each participant had an opportunity to get involved.

There were comments from "Official Listeners" throughout the program. The Listeners were charged with focusing attention on pertinent topics by raising questions before and after presentations, interpreting the importance of ideas, and helping to define problems needing attention. Collectively, they were to serve as the Institute's guide to clear thinking. The Listeners were: Mrs. Mary Boyvey, Texas Education Agency; Miss Janice Kee, U. S. Office of Education; Miss Jan Wolford, Mobil Research and Development Corporation Library; Stanley McElderry, Dean, Graduate School of Library Science, University of Texas; and Heartsill Young, University of Texas Library.

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*Proceedings of 1968 Reference Round Table Conference are available for $1.50 from Miss Maxine Johnston.

There were seven speakers, each charged with a specific assignment. Interspersed with the speakers and the reports from the "Official Listeners" were coffee breaks, lunch, and (most importantly, as it turned out) several of the above-mentioned "real" questions. In addition, all attendees received a healthy stack of literature. The two pieces of greatest importance were a *Glossary of Terms Related to Library Cooperation and Inter-Library Networks,** and a *Bibliography on Inter-Library Networks, Modeling and Simulation and Other Problem-Solving Methods.** The meeting concluded with each node answering a specific question regarding network design. A full day was planned—to begin at 9:00 a.m.—to conclude by 5 o'clock. The schedule was met. So much for the mechanics of the program.

Who Said What?

Richard Perrine, Fondren Library, Rice University and President of ALA's Reference Service Division, reviewed some of the current writings on library networks and networking. He also sketched the proposed ALA Atlantic City program which brings together three ALA divisions in one joint effort on "Resources and Services: Expanding Modes of Access."

Dr. Edward G. Holley, Director, University of Houston Libraries, and a consultant to the Office of Education Knowledge Network Task Force discussed Networks for Knowledge (Title VIII of the Higher Education Act of 1965). Dr. Holley predicted that the Office of Education will choose to fund several large pilot demonstration projects as a means of testing the Knowledge Network. Existing, formally organized library cooperatives, where contractual arrangements exist among institutions, will

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*Copies available from Maryann Duggan for duplication costs: Glossary, $2.00; Bibliography, $1.00.

probably receive first priority. He also urged that applications for projects be submitted, even though the initial money flow as appropriated by Congress may be quite small.

The results of a survey of existing networks and cooperative ventures now serving Texas libraries was reported by Mr. Waters. This survey showed 47 ventures now being utilized in the state. Some are true networks, such as R.I.C.E. (Regional Information and Communication Exchange) and CORAL (Council of Research and Academic Libraries). Others are union lists, such as the *Union List of Periodicals for the Top 26 Counties of Texas.* Isolated, their influence and strengths are diminished. If banded together and coordinated, they could form the nucleus of a statewide library network. Two principal needs were pinpointed by the survey. First, a bibliographic center, or centers, for Texas is needed to assist in locating resources and in "switching" requests. Secondly, a common communications carrier (Telex or TWX) is needed to enhance inter-library cooperation within the state by "interfacing" existing networks.

Mrs. Marie Shultz of the Texas State Library reported that an evaluation study of the public library network was in process. Preliminary data based on an analysis of over 5,000 loan transactions indicated an average communication cost per transaction of $1.53. The final evaluation report is expected to be published before June 30, 1969, by the Texas State Library.

Richard O'Keeffe next reported on the Houston LSCA Title III Special Project. It involves the linkage of R.I.C.E. and the Houston Public Library, thus expanding the resources of both by interfacing the public library network with the university library network along the Texas Gulf Coast.

The Dallas Pilot Model

Miss Duggan stated that the conceptual design of an ideal inter-library network is being developed from a Dallas Pilot Model of Inter-library Cooperation, sponsored as a Special Project under the Library Services and Construction Act Title III. In the Dallas Pilot Model, 18 libraries volunteered to participate for the purpose of analyzing the on-going inter-library loans in the Dallas Metropolitan Area. As much as possible, "typical" libraries representing all types of service needs were selected to participate in the Pilot Model. An analysis for the month of October 1968 of the inter-library loan borrowing/lending activities of 18 Dallas County libraries shows that special libraries have the highest "hit" percentage of items requested of them. Public libraries are at the low end of the scale. It was suggested by an Institute participant that the reason for the public libraries' low "batting average" is the tendency to dump everything on them if no one else is considered a good prospect for owning the needed item. Unfilled requests are 43 per cent of the total transactions in the first sampling.

This Pilot Model study produced a methodology for analyzing inter-library networks and inter-library loan transactions and certain concepts regarding network dynamics were developed. A borrowing/lending ratio formula which can be used as a tool for understanding inter-library networks was presented by Miss Duggan. The work in the Dallas Pilot Model led to the development of "node dependency coefficients" and "network activity coefficients" which can be used in designing and analyzing inter-library network behavior. Types of inter-library relations were identified as "homogeneous vertical" or "homogeneous horizontal," or "heterogenous vertical" or "heterogeneous horizontal," depending upon which sector of the four types of libraries and on which geographic level the inter-library transactions occurred. The Pilot Model looked at the geographic levels of transactions, as well as the direction of flow of transactions among the libraries and between the participating libraries and the "outside world." The type of material requested, as well as the format or channel of the request, was also considered in the Pilot Model.

Games Librarians Play

"Games Librarians Play"—or, "A Day in the Life of an Interlibrary Loan Librarian" was uproariously detailed by Francine Morris, Reference Librarian, University of Texas at Arlington. The printed word cannot do justice to Francine's delivery. All we can say is that it is no easy chore to get book A to library B via the United States Postal Service—or in any other manner either. The need for coordination and planning was clearly shown by Francine's recount of one hectic day!

Various new methodologies have been developed for problem solving strategies in the past few years. The bibliography prepared for the Reference Round Table summarized some of the more pertinent methodologies, such as operations research, modeling and simulation. These are particularly amenable for use in studying complex library situations. Dr. Richard Nance, Professor of Information Sciences at the Institute of Technology, Southern Methodist University, presented a paper on "Modeling and Simulation of Library Networks," using an analytical-mathematical model. Networks and network models of industrial and military systems have received much attention in operations research literature. The extension of network modeling to library networks provides some interesting insights into inter-library systems design. Dr. Nance offered a general library network model and a mathematical statement of a network problem. Possible solutions of the problem were presented. An example of the use of the model in evaluation and design situations was provided. The necessity for further work in both theoretical and applied areas was emphasized by Dr. Nance.

Dr. Nance's work showed that library networks may be modeled as general capacitated networks, with multi-channel flows when the message transfer function is the only consideration. The assumptions required for such a model may be relaxed to consider classes of messages, but when document transfer is the concern, the general capacitated network formulation breaks down. Development of special algorithms to solve the type of network problems resulting from message and document transfer among libraries is required. Dr. Nance offered two hypothetical examples to show the use of analytical models in designing library networks. In one example, the model provided an evaluation tool for indicating how a library network should perform in order to derive a maximum benefit for the entire network. The models serve a design purpose in the second example in which the installation of a Union Catalog or bibliographic center within the network is shown to increase the benefit of the network by a measurable quantity. Dr. Nance also suggested that the model could be used in specific cases to evaluate alternative structure of library networks, such as centralized versus decentralized. Adaptation of the ana-

lytical model might be helpful in problems of interfacing existing library networks. Because of the extremely large number of possible configurations in the interfacing problem, one most likely would settle for heuristic solutions rather than optimum values. The work presented by Dr. Nance was mathematically rigorous and does provide a new tool for use by library network designers and for evaluating library networks.

These eight papers set the stage for the Institute's previously stated utopian goal—the presentation of an ideal reference and information network. This impossible task had been given to Miss Duggan by Miss Johnston and Mr. Waters. She, working with a Statewide Network Study Group, accepted the challenge and presented to the conference a summary of the 14 basic elements of an ideal network. The elements are:

1. An ideal network must contain an organizational structure providing for fiscal, legal, planning, policy formulation, and requiring commitments, operational agreements, and a common purpose.
2. A statewide ideal inter-library network must result in collaborative development of resources, providing for cooperative acquisition of rare and research material, and for strengthening local resources for recurringly used material. It was also felt that multi-media resources development was essential.
3. The actual nodes in a network must be identified, providing for designation of role specialization, as well as for the geographical configuration of the network.
4. Each node or participant in the network must identify their primary patron group, providing for assignment of responsibility for library service for all citizens within the network area.
5. Each node and the network must identify the "levels of service," thereby providing for basic needs of patron groups, as well as special needs, and for identifying the distribution of each of the service types among the nodes.
6. The network must provide capability for "referral" as well as for "relay," and for document

transfer as well as for information transfer.

7. It was also felt by the Statewide Study Group that the ideal statewide inter-library network must provide for the legal right of access, providing fiscal contractual policies.
8. The establishment of a bi-directional communication system permitting "conversational mode" format is also essential. The bi-directional communications system should also be designed to carry desired messages and document transfer load at each level of operation throughout the network.
9. A common standard message code is essential for providing for understanding among the nodes on the network if communication is to be effective.
10. The Statewide Study Group also felt that a central bibliographic record or locator file was essential to provide for location of needed items within the network, thereby minimizing the number of "false drops" or "misses" in the network.
11. If the network is to be totally effective and efficient, there must be a built-in switching capability, which would provide for interfacing with other networks as well as determining the optimum communication path within the network. Decision on switching at local level or at state level must be determined by appropriate studies and analysis.
12. Determining the type of material or the type of question to put on the network must be done by use of "selectivity criteria" of network function, which would provide guidelines of what is to be placed on the network.
13. The ideal network, furthermore, should have designed within the system an evaluation criteria and procedure, providing feedback from users and operators, and providing a means for a network evaluation and modification to achieve maximum operational utility.
14. Additionally, there should be built into the program of the ideal network training aids, short courses, seminars, and workshops, as well as instructional guides to provide the users and operators

> up-to-date information on policies and procedures. These training programs should also give feedback information to enhance the network's operational conditions.

In summary, Miss Duggan stated that the statewide inter-library network should be so designed that any citizen anywhere in the state can have access to the total library and information resources of the state through his own local library, either academic, public, school, or special.

Each node was then given an opportunity to network their node within the conceptual design of the ideal network. This was accomplished by asking each table to formulate their policy on one of 20 policy problems in designing an interlibrary network. The participants were advised that time had now come for decisions and action, and it was assumed that the nodes represented real types of libraries and locations of libraries. The nodes were asked to respond to such questions as: Which network do you wish to join? What type of services or resources do you expect to get from the network? What selectivity criteria will you use? What type of services or resources does your node expect to offer the network? By what legal authority can you join a network? What type of formal agreement do you visualize? What communication channel do you plan to use? How much will it cost? The nodes were also asked to define the geographic configuration they wished in the network, and whether it would mix governmental units and types of libraries. The nodes were asked to respond to a question regarding local switching versus statewide switching versus switching at an MRC level. Where and how should the nodes interface with other networks was also a question raised for discussion. Criteria for evaluating network performance was another topic discussed by the nodes. Relative emphasis on patron mobility or material mobility was a basic question. What role specialization does each node visualize? The final question concerned node/network conflict in goals.

The Reference Round Table Pre-Conference Institute did indeed generate sparks. Just a few of the events that occurred since this Institute on March 26 are as follows: Mr. Richard Nance's paper, "An Analytical Model of a Library," has been submitted for publication by the American Society of Information Sciences. The *Wilson Library Bulletin* has asked permission to publish Miss Francine Morris's paper. Miss Duggan was contacted by a publisher from New York suggesting that the entire Pre-Conference Institute be widely published and that "The Games Librarians Play," and "Networking Your Own Library" be marketed for use in library schools. The American Library Association has offered an opportunity for Miss Duggan to present a summary of this Institute and some of the developments in networking dynamics to a June 25 joint meeting of the American Library Association RSD/ISAD/RTSD. Some of the concepts developed at the RRT Institute were thought to be of sufficient importance to be included in the TLA Library Development Committee's "Work Program" for 1969-70.

The formal proceedings of the 1969 Reference Round Table Pre-Conference Institute will be published as a separate monograph, either by TLA or the Texas State Library. Those wishing to receive copies should contact Maryann Duggan, Director of Industrial Information Services, Southern Methodist University, Dallas, Texas 75222.

APPENDIX D

DALLAS AREA PILOT MODEL*

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*The reader should review the descriptive paper on this study as reproduced in Appendix C.5-f.

APPENDIX D.1
D.1-a
DALLAS AREA PILOT MODEL
PRESENTATION TO JANUARY 14, 1969 MEETING

A. Purpose

1. To acquire understanding of interlibrary relations inter- and intra- Dallas area leading toward improved design of interlibrary cooperation.
2. To determine the best way to interface public, university, special, school libraries to optimize (a) document transfer, and (b) cooperative planning.

B. Strategy

1. Select participants; obtain commitment
2. Identify pertinent operational parameters*
3. Develop data collection tools*
4. Collect data
5. Install TWX/Telex interface
6. Encourage use of TWX/Telex
7. Observe and collect new data*
8. Analyze patterns of use; identify problems*
9. Prepare report with recommendations.

C. Network Parameters Considered

1. Identification of nodes
2. Geographic configuration
3. Organizational configuration
4. Communication channel
5. Switching node
6. Type of message
7. Frequency of message
8. Length of message

---

*Tasks to be performed cooperatively with personnel from Southwest Center for Advanced Studies per enclosed Agreement.

C. Network Parameters (continued)

9. Turn-around time
10. Interfacing with other networks
11. Linkage configuration
12. Percent of "hits" at each level
13. Policy on handling "no-hits"
14. Borrowing/lending relationships
15. Cost analysis
16. Financing and funding.

Summary of Meeting

All present agreed to participate and submit necessary data. It was agreed to hold a second session for briefing on the data collection procedures.

PROGRAM
LIBRARY SERVICES AND CONSTRUCTION ACT - TITLE III
LUNCHEON - JANUARY 14, 1969

11:50 a.m. - Introduce Guests

12:00 noon - Luncheon

12:30 p.m. - Review of Inter-Library Cooperative Programs in the Dallas Area:

1. Inter-University Council
2. Dallas County Library Association
3. Metropolitan Library Association
4. Industrial Information Services (STSA)
5. Title III, State & Local, Projects
6. Goals for Dallas, ITFLWG

1:30 p.m. - Review of LSCA Title III National Programs and Future National Developments

2:15 p.m. - The Future of Inter-Library Cooperation in Dallas

2:30 p.m. - Adjourn

* * *

D.1-b

PARTICIPANTS
LIBRARY SERVICES AND CONSTRUCTION ACT - TITLE III
LUNCHEON - JANUARY 14, 1969

Dr. C. C. Albritton, Dean
Graduate School of Science & Humanities
Southern Methodist University

Mrs. Mary Ann Allan
Goals for Dallas
Library Task Force

Miss Linda Allmand
President
Dallas County Library Association

Miss Marguerite Anderson
Librarian
Richardson Public Library

Miss Lois Bailey
Fondren Librarian
Southern Methodist University

Mrs. Violet Baird
Librarian
Southwestern Medical School

Mrs. Dee Dee Brannen
Goals for Dallas
Library Task Force

Mr. Truman Cook
Grants and Contract Administration
Southern Methodist University

Miss Anita Decker
Texas State Library
Field Consultant

Mr. Robert Dillard
Goals for Dallas
Library Task Force

Miss Maryann Duggan, Director
Industrial Information Services
Southern Methodist University

Dr. LeVan Griffis
Vice Provost
Southern Methodist University

Mr. John Hudson
Director of Libraries
University of Texas at Arlington

Mr. George T. Johnson
Head Librarian
Bishop College

Miss S. Janice Kee
Department of Health, Education
& Welfare
U. S. Office of Education - Dallas

Miss Dorothy Kittel
Department of Health, Education
& Welfare
U. S. Office of Education - Washington

Mrs. Mary Langford
Library Coordinator
Irving Independent School System

Mr. Lowell Lindsay
Director of Municipal Library
Garland, Texas

PARTICIPANTS
LSCA TITLE III LUNCHEON - January 14
Page 2

Mr. Ed Montgomery
Bio-Information Planning
Southwestern Medical School

Miss Mattie Ruth Moore
Library Consultant
Dallas Independent School District

Dr. Richard Nance
Institute of Technology
Southern Methodist University

Mrs. Mayrelee Newman
Librarian
Dallas County Junior College

Mr. Pierson Ralph
Goals for Dallas
Task Force Coordinator

Mr. David Reich
Associate Director
Dallas Public Library

Col. Stanley Reiff
Executive Secretary
Inter-University Council

Miss Ammarette Roberts
Manager, Information Services
Lone Star Gas Company

Mr. Prentiss Selby, Manager
Technical Information Center
Texas Instruments, Inc.

Mr. Jim Stephens
Science/Engineering Librarian
Southern Methodist University

Mrs. Elizabeth Stetson
Librarian
Dallas County Library System

Mrs. Robin Taylor
Librarian
Southwest Center for Advance Studies

Mr. Robert M. Trent
Director of Libraries
Southern Methodist University

Mr. Peter Van't Slot
Associate Director of Development
Southern Methodist University

Mr. Dick Waters
Branch Coordinator
Dallas Public Library

Mrs. Julius Wolfram
Goals for Dallas
Library Task Force

Dr. H. F. Yarbrough, Manager
Technical Information Center
Mobil Oil Corporation

D.1-c

Date: ____________

TO WHOM IT MAY CONCERN:

I have reviewed the SMU/TLA/GFD Title III LSCA Proposal dated November 14, 1968, entitled "A Proposal for a Library Inter-Network Study, Demonstration and Pilot Model".

I am willing to participate in the "pilot model" as proposed therein. I am willing for my normal daily salary to be recorded as matching funds for this project for the days I spend on the pilot model project. This will require that I submit a summary statement showing hours spent on the project and estimated total salary committment. There will not be an actual cash transfer; only a record of time spent and estimated value.

Signed: ____________________

Phone: ____________________

D-8

SUMMARY

COMMITMENT OF TIME AND EXPENSES TO THE SMU TITLE III LSCA PROJECT

TO WHOM IT MAY CONCERN:

I hereby verify that the following donated time and/or expenses have been contributed toward SMU's Title III LSCA Matching Funds Requirements:

TIME (Attach Separate Sheet for Each Person)

DATES					
From	To	PERSON	PURPOSE	HRS.	EST.COST

EXPENSES (Attach Separate Sheet for Each Trip. Travel not to exceed $________ per diem.)

DATES				
From	To	TYPE OF EXPENSE	PURPOSE	COST

Participating Institution

Date Submitted

By: ______________________

Authorized Signature

D.1-d

AGREEMENT BETWEEN INDUSTRIAL INFORMATION SERVICES, SOUTHERN METHODIST UNIVERSITY, AND THE SOUTHWEST CENTER FOR ADVANCED STUDIES

The Industrial Information Services, Southern Methodist University, (hereinafter referred to as IIS) holds a contract with the Texas State Library under Title III of the federal Library Services and Construction Act to study ways and means of interfacing existing state-wide library and information networks serving all types of users.

The IIS and the Southwest Center for Advanced Studies (hereinafter referred to as SCAS) agreed that SCAS can make a contribution to this study through the computer processing and visual display of data gathered by the IIS under this contract.

The IIS and SCAS therefore agree as follows:

1. Library data provided by IIS will be subject to computer analysis by SCAS to determine the following factors:

    a. Number of interactions with and between five levels of libraries, i.e. directions and magnitude of message flow.

    b. Relative borrowing/lending ratios by individual libraries and by types of libraries; i.e., role of the individual library in the network.

    c. Comparison of types of items with types and levels of libraries; i;e;, the dependency situation.

    d. Preparing the data in necessary format to input into a mathematical model developed by IIS under the Title III project.

    e. Cooperatively with IIS staff, evaluating the data sample and identifying other types of data needed for further implementation of the mathematical model.

    f. Cooperatively with IIS staff, identifying preferred methodology for this type of data analysis.

    g. Presentation of the results of data analysis phase in visual forms, slides, graphs, charts and overlays.

2. Preliminary input data will be provided by IIS to SCAS on or before February 21, 1969. SCAS will conclude preliminary computer analysis and visual display of data so provided prior to March 26, 1969. As requested by IIS, SCAS will conduct further refinement and analysis of the data by June 30, 1969.

3. SCAS will provide the foregoing analyses and visual displays at no cost to IIS, such costs not to exceed, however, $4,000. SCAS will verify on forms provided by IIS the actual costs of personnel time, computer charges and other expenses contributed by SCAS under this Agreement.

4. By mutual consent, this Agreement may be extended to August 31, 1969.

Entered into this ________ day of ____________, 1969.

On behalf of IIS

____

____

On behalf of SCAS

R. C. Peavey

Assistant to the President
Southwest Center for Advanced Studies

APPENDIX D.2
PARTICIPANTS BRIEFING SESSION OF FEBRUARY 12, 1969

D.2-a

January 28, 1969

File: Title III
Dallas Pilot Model

TO ALL PARTICIPANTS IN THE DALLAS PILOT MODEL
OF INTER-LIBRARY COOPERATION (Per Enclosed List)

May I express to you my personal appreciation for your enthusiastic attendance at the January 14 luncheon at the Hilton Inn. Thanks to you, Miss Dorothy Kittel was very much impressed with Dallas libraries and librarians!!

We have now received enough favorable response from most of you to indicate that we should proceed with the Pilot Model project in Dallas. As many of you have indicated, you would like to have an opportunity to discuss the details of the proposed model. Thus, we are scheduling an in-depth planning session for all participants to discuss all aspects of data gathering, data analysis, data interpretation, installation of TWX/Telex, experimental use of facsimile transmission, statewide switching service, conceptual model of ideal network for Dallas, etc.

This planning session will be held Wednesday, February 12, SMU Science Information Center, Room 119, 9:00 a.m. to 12:30 noon, followed by Dutch treat lunch. A proposed agenda is enclosed. Your participation is needed to make the Pilot Model the successful experiment we all desire. If for some reason you cannot come, please assign a deputy so that your thinking and organization will be represented. A reservation form is enclosed for your use.

If you have any questions concerning any aspect of the Pilot Model, I can be reached at EM3-3011, 8:30 to 5:30 Monday through Friday, or BL3-6082 after 8:00 p.m. evenings.

I look forward to working with you on this exciting project.

Maryann Duggan rm
Maryann Duggan

MD:rm

Encl.

PROPOSED AGENDA

DALLAS PILOT MODEL PLANNING MEETING

FEBRUARY 12, 1969

ROOM 119, SMU SCIENCE INFORMATION CENTER

* * *

9:00 a.m.	Purpose of Pilot Model
9:15 a.m.	Data Collection Phase - Discussion
9:30 a.m.	Data Analysis Phase - Discussion
10:00 a.m.	Network Modelling - Richard Nance - Discussion
10:30 a.m.	Coffee
10:45 a.m.	Conceptual Design of Ideal Dallas Library Network
11:30 a.m.	Demonstration Phase - TWX/Telex/Facsimile Transmission
11:45 a.m.	Where Do We Go From Here?

* * *

Above is Only Guide
to Discussion

D.2-b

SUMMARY OF

DALLAS LIBRARIES PILOT MODEL*
SECOND MEETING - FEBRUARY 12, 1969

PARTICIPATING LIBRARIES

Southwest Medical School of Univ. of Texas
Dallas Public Library
Bishop College Library
SMU Science Library
SMU Fondren Library
Dallas County Junior College
Univ. of Texas at Arlington
Academy of Computer Technology
Mobil Research Library
Lone Star Gas Library
Texas Instrument Libraries
Inter University Council
Richardson Public Library
Dallas Independent School District
Irving Independent School District
Southwest Center for Advanced Study
Dallas County Library System

The purpose of the pilot model is to identify and define the parameters of the interlibrary relationships, specifically at the present in the interlibrary loan area. Hopefully the study will answer the following items:

1. What is the direction of flow of interlibrary loan borrowing and lending, add to and from whom.
2. What is the volume of interlibrary loans
3. What are the categories of borrowed materials
4. What is the message channel, or format of the request.

In setting up a system for studying the directions of flow, Maryann Duggan presented geographical categories made up of the following components:

1. The Pilot Model Libraries
2. Libraries within city limits of Dallas
3. Libraries within Dallas Co. limits
4. Libraries within Dallas MRC area
5. Libraries within Ft.Worth MRC area
6. Libraries within Texas state lines
7. Multi-state, interstate, regional libraries
8. Libraries within United States continental jurisdiction
9. International, e.g. those outside of U.S.

---

*Summary prepared by Virginia Brannen.

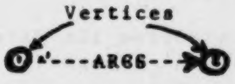
CRITIQUE OF FORMS

The critique of the forms presented at the last meeting of the Dallas Libraries Pilot Meeting is in the form of questions and answers and statements made.

1. How is anyone else accounting for the time lag? Ans: There appears on the monthly summary a time element, which answers this in averages, but does not account for the individual items time lag.
2. There needs to be a line for subtotals at the bottom of the daily forms.
3. The location of the other library in terms of town and type of library will be translated to the geographical and type of library categories.*
4. The type of material, its format, needs to be defined. What is a document? Does a technical report belong under the document category? Ans: Place technical report under document.
5. Mail needs to be defined. Where does a form letter belong? Place form letter under ILL form, and individually created letter under mail.
6. Under items not supplied, OTHER means at bindery or can't find it.
7. Spheres of influence such as IIS and RICE need to be defined as far as categories of libraries. Define IIS, RICE as switching centers.

LIBRARY NETWORK - Dr. Richard Nance

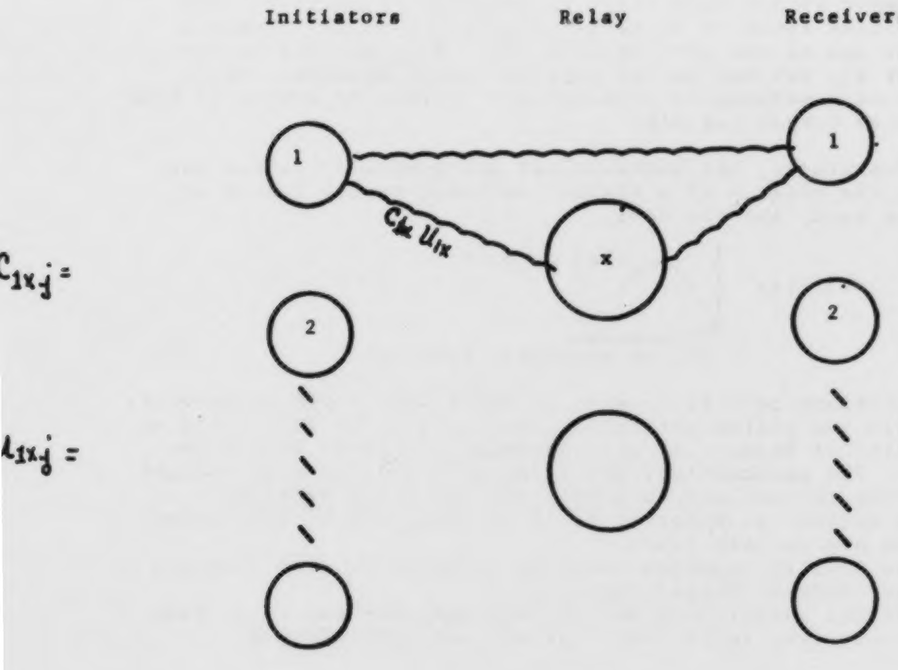
If one removes the library, a network consists of two things (x) vertices and (----) arcs. Vertices are defined as being entities, and arcs as the action between entities.



The library network which Dick Nance presented is limited to sending messages, where for the sake of definition, there are initiator libraries and receiver libraries. There exists a subset of libraries which act as relay libraries (also defined as switching cetars). These Relay Libraries have such material as finding guides (Union Catelogs) TWX, TELEX. In theory they never initiate, but act strictly as relay libraries. Not all libraries can function as vertices, therefore the relay libraries.

---

*Note: This proved to be a future coding problem of considerable magnitude.



Messages

Channel capacity = $C_{1x} = j$
So many messages can be sent over channel C from 1 to x, limiting the number of ILL's a library can process.

Utility of channel = $U_{1x} = j$
Defined as the utility of the channel 1 to x. This is not called cost because other factors such as time are involved/

IF:
- i = number of messages
- j = channel capacity (or limitation on utility)
- k = channel

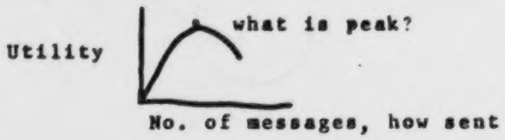
THEN:
U_{ijk} is the utility to be gained through messages to be sent

What we will attempt to do is maximize i, j, and jk

$$\sum_{i} \sum_{j} \sum_{jk} U_{ijk} X_{ijk}$$

I_1 has some number of messages is is going to send, and R_1 has some number of messages which it is going to receive. The message line could be I_1 to R_1 without the relay. However this may not be the most optimal use. X_{ijk} may not be the best for I_2, but may be the best for total network. Need to give up something to join network inorder to arrive at some beneficial result for all.

Graphically, the mathematical modeling will define the peak of the utility of a channel in ratio to the number of messages sent, and how sent.



Decisions need to be made at state wide level of networks, on should you switch nationally, regionally, to SMU, Autin or University of Texas. At what geographical level should you switch. The mathematical modelling will give us some insight to solving the problem, but will not solve the problem; It will define way Which it is to be done, and at this point can find max. on this level.

The utility function needs to be defined. Uti lity may be different between libraries.

Another question is are all messages the same. We know that in the real world that they are not, therefore $\sum_{l}$

$$\sum_{i}\sum_{j}\sum_{k}\sum_{l} X_{ijkl}\, U_{ijkl}$$

The greatest benefit will be the structuring of the problem. It will set the criteria on when you go to Austin or when you go locally. It will gain some insight within the Dallas Area of concepts of interrelations.

Col. Reiff stated that it is not what would be best, but what is used will be defined.

The model that Dick Nance presented is a multi-commodity capacitated multi-linked network. In the case of 10 libraries in the network, with 2 relay libraries and 3 channel, it is possible to have 688 linear equations.

So far this is only a message network. If documents enter into a network, this is a location allocation problem which have not been solved mathematically.

FUTURE in terms of what needs to be done, and what can be done.

1. Define terms
2. Jim Stevens is having a bibliography done on this subject
3. Reference questions may be answered by mathematical modelling in the future.
4. The Utility functions need to be defined, which may be different at different libraries
5. Identify what kinds of information should be collected and how gathered.

It is conceivable that library patrons can be identified, and the lending and borrowing of not normally library patrons can be detected. The problems with finding this type of information is how to capture this data and then define how incomplete the data is. Each library has its own level of methodology. At least this pilot model may create some sort of standardization.

Based on the network model of Dick Nance, it is hoped the answers to many of the interlibrary relationships in terms of the patrons will be found.

Note: In retrospect, this meeting of February 12 contained the seeds of failure! Too much time was spent on theoretical considerations and not enough time on what was to be done with the data, what type of data were needed and how Dr. Nance's work would relate to the work of Mr. Peters at SCAS. Due to the inexperience of the investigator, however, these "seeds of failure were not recognized until too late.

MD, December 1971

APPENDIX D.3

RAW DATA COLLECTION

A. Procedure and Instruments

Each participating library was supplied the following four forms for collecting data on one month's interlibrary loan transactions--both borrowing and lending.

1. Monthly Summary - Borrowing
2. Daily Borrowing Record
3. Monthly Summary - Lending
4. Daily Lending Record

Copies of these forms are enclosed. Most of the data elements requested on the form are self-explanatory except for the following:

S = Serial (Monographic)
D = Document (Federal or State)
M = Monograph (Book, non-serial)
J = Journal (periodical)

The forms were completed by the participating libraries and returned to the investigator for processing and analysis. The month of October 1968 was selected as the standard time period to be studied, with the exception of two participants who supplied January/February data.

It was initially intended to collect one month of data prior to the pilot model TWX/Telex installation to compare these data with another month later in the pilot model period. This idea had to be abandoned after it was learned that the computer analysis would not be possible.

MONTHLY SUMMARY - BORROWING

LIBRARY ______________________

MONTH ______________________

	S	D	M	J	OTHER	TOTAL	%
NO. ITEMS REQUESTED							
LOCATION OF LENDER:							
In Dallas County							
In Texas							
Out of State							
TYPE OF LENDER:							
Special							
Public							
College & Univ.							
School							
Government							
Other							
FORMAT OF REQUEST:							
Telex							
TWX							
ILL Form							
Telephone							
Letter							
Other							
NO. REQUESTS REQUIRED							
RATIO: $\frac{\text{REQUESTS}}{\text{ITEM}}$							
ITEMS SUPPLIED BY:							
Loan							
Photocopy							
ITEMS NOT SUPPLIED:							
Not in Collection							
In Use							
Non-Circulating							
Other							
TIME LAG - DAYS Request to Receipt							

DAILY BORROWING RECORD

YOUR LIBRARY ____________________ MONTH ____________________

DATE	LENDING LIBRARY	LOCATION	TYPE	FORMAT OF REQ	TYPE OF ITEM REQD					SUPPLIED BY			NOT SUPPLIED			
					S	D	M	J	O	L	P	M	NIL	IU	NC	O

D-20

MONTHLY SUMMARY - LENDING

LIBRARY ______________________

MONTH ______________________

	S	D	M	J	OTHER	TOTAL	%
NO. ITEMS REQUESTED							
SOURCE OF REQUEST:							
In Dallas County							
In Texas							
Out of State							
TYPE OF REQUESTER:							
Special							
Public							
College & Univ.							
School							
Government							
Other							
FORMAT OF REQUEST:							
Telex							
TWX							
ILL Form							
Telephone							
Letter							
Other							
NO. ITEMS SUPPLIED							
ITEMS SUPPLIED BY:							
Loan							
Photocopy							
Microform							
ITEMS NOT SUPPLIED:							
Not in Collection							
In Use							
Non-Circulating							
Other							

D-22

DAILY LENDING RECORD

YOUR LIBRARY ______________________ MONTH ________________

DATE	BORROWING LIBRARY	LOCATION	TYPE	FORMAT OF REQ	TYPE OF ITEM REQD					SUPPLIED BY			NOT SUPPLIED			
					S	D	M	J	O	L	P	M	NIL	IU	NC	O

B. Gross Results

Fourteen libraries submitted the requested data. The total number of interlibrary loan transactions reported was 2,036. Of these, 1,524 (67 percent) were filled and 443 (23 percent) were unfilled. Table I lists the participants and the number of transactions (and relative percentage of transactions) reported during the study.

TABLE I

PARTICIPANTS IN THE DALLAS AREA PILOT MODEL

Name of Library	Code	Geog. Location	Type Library	Total Trans.	%
1. Dallas Public (Main)	21	Dallas (City)	Public-MRC*	255	12
2. Richardson Public Lib.	23	Richardson (Co.)	Public-Type III*	8	<1
3. Nicholson Memorial Lib.	22	Garland (Co.)	"	3	<1
4. Dallas County Library	20	Dallas (Co.)	Public-County	6	<1
5. El Centro Jr. College	06	Dallas (City)	Acad.-Public	8	<1
6. Bishop College	05	Dallas (City	Acad.-Private	28	1.1
7. SMU-Science/Engineering	02	Dallas (City)	"	120	5.9
8. SMU-Fondren	03	Dallas (City)	"	128**	6.0
9. U. of Texas at Arlington	04	Arlington (Adj. County)	Acad.-Public	247	12
10. Southwestern Med. School	07	Dallas (City)	Acad.-Special	412	21
11. Southwest Ctr. Adv. Studies	24	Richardson(Co.)	Acad.-Special	203	9.9
12. Industrial Inform. Svcs.	01	Dallas (City)	Acad.-Switch.	400	20
13. Mobil R & D Corp.	08	Dallas (City)	Spec.-Indust.	64	3.2
14. Texas Instruments Inc.	09	Richardson(Co.)	"	152**	7.5
15. Univ. Computing Corp.	10	Dallas (City)	"	2	<1
16. Dallas Ind. School Dist.	12-17	Dallas (City	School-Public	0	0
17. Irving School System	18-19	Irving (Co.)	"	0	0
			Total	2036	

---

* Major Resource Center.

**Jan./Feb. data; Oct. data not available.

APPENDIX D.4

CODING OF RAW DATA

D.4-a

CODE DESCRIPTION

In order to input the raw data of each transaction into the computer to analyze the variables, it was necessary to code each transaction for key punching. The code designators used for each data element variable are presented in Table II. Each transaction was coded on a key punch sheet in the 80 column card format presented in Table III.

A total of 869 transactions were coded and keypunched for computer input. The coding time proved to be excessive within the time and cost constraints of the project. Thus, the decision was made to stop the data input at that level and to concentrate on analysis of variables by less quantitative means.

The raw data are in the archive files of the project for future computer manipulation, if desired. Future investigators of interlibrary loan transactions should be forewarned that the problems associated with coding and data input of the pertinent data elements are a tedious, time-consuming, and costly experience. The original data collection instruments should be designed with this fact in mind.

TABLE II

CODE DESIGNATIONS USED ON PILOT MODEL DATA

Type of Library	Code
1. Special	10
(1) Industrial	11
(2) Academic-Medical	12
2. Public	20
(1) City	21
(2) County	22
(3) City/County	23
3. Academic	30
(1) Jr. College	31
(2) Private	32
(3) Public	33
(4) Research Institute	34
4. School	40
(1) Elementary	41
(2) Secondary	42
5. Government	50
6. Other	60
7. Switching Center	70

Geographic Location	Code
City (Dallas)	1
County (Dallas)	2
Dallas MRC Area	3
Fort Worth MRC Area	4
State	5
Region (5 states)	6
National	7
International	8

TABLE III

PUNCH CARD LAYOUT FOR INPUT OF CODED DATA, DALLAS PILOT MODEL

Card Col.	Designation of Field
1- 6	Date of Transaction, Month, Day, Year
7-25	Name of Lending/Borrowing Library
26-27	Type Code for Library in 7-25 (See Table II)
28-47	Geographic Location of Library in 7-25
48	Geographic Location Code for " " (Table II)
49-55	Format of Request
56	Blank
57-61	Type of Item Requested
62	Blank
63-65	Item Supplied by
66	Blank
67-70	Not Supplied by
71	Blank
72-73	Participating Library Code (See Table I)
74	Blank
75	B = Borrowing Transaction, L = Lending Transaction
76	Punched - Switching Center Transaction
77	Blank
78-80	Card Sequence

APPENDIX D.5

SIGNIFICANT VARIABLES AND RESULTS

One of the other difficult aspects of the pilot model was determining significant variables to analyze. The following variables were considered:

1. Volume of borrowing and lending for each library as a function of the total sample.
2. Ratio of borrowing and lending at each library.
3. Geographic location of borrowing and lending transactions and "net in-out balance" of the pilot model area.
4. Type of "transactions mix" by type of library (432 possible combinations!)
5. Type of document requested.
6. Format of message.
7. Success ratio (filled requests).

With the assistance of the Southwest Center for Advanced Studies personnel, computer programs were written in PL-1 for the following analysis:

1. Summary of lending by type of library.
2. Summary of borrowing by type of library.
3. Summary of lending by geographic location of requestor.
4. Summary of borrowing by geographic location of requesting library.
5. Calculation of borrowing/lending ratio by type of library.
6. Summary of borrowing and lending by type of item requested.
7. Summary of borrowing and lending by format of request.
8. Comparison of all of above seven variables by geographic location in a graphic plot.

About the time the programs were written, de-bugged, and the 869 transactions run as a test (June 1969), the Southwest Center for Advanced Studies underwent considerable reorganization, the programmer was reassigned and time constraints prevented documentation of the programs. The program listings are in the archive files of the project for review by future investigators, if desired.

Due to the above situation, it became necessary to resort to manual analysis of the raw data. The following tables present these findings on a refined sample of valid raw data.

Table IV summarizes the network activity by type of library participating in the pilot model. Certain "node-network coefficients" were evolved to analyze these data, as follows:

Bn = number of borrowing transactions originating from the node

Ln = number of lending transactions received by the node

$\frac{Bn}{Bn + Ln}$ = Node Dependency Coefficient, i.e. relative percent of borrowing by a node compared to total activity at the node

Bt = total borrowing transactions originating from all participants

Lt = total lending transactions initiated by all the participants

$\frac{Bn + Ln}{Bt + Lt}$ = Node Activity Coefficient, i.e. relative percent of all transactions among the participants occurring at a given node

The Node/Network Dynamics Grid illustrated in Figure 1 was developed as an analytical tool to assist in understanding the pilot model interaction.

TABLE IV

NODE/NETWORK DYNAMICS OF TOTAL TRANSACTIONS REPORTS*

	Library	Bn	Ln	Bn + Ln	$\frac{Bn}{Bn + Ln}$	$\frac{Bn + Ln}{Bt + Lt}$
1.	DPL - Main	17	252	269	0.06	0.16
2.	Richardson PL	4	0	4	1.00	0.01
3.	Garland PL	3	0	3	1.00	0.01
4.	Dallas Co. Lib.	0	5	5	0.01	0.01
15.	Type Total	(24)	(257)	(281)	(0.08)	(0.18)
5.	UTA	72	176	248	0.28	0.15
6.	SMU-Sci/Eng	22	98	120	0.18	0.07
7.	SMU-Fondren	28	59	87	0.32	0.05
8.	Bishop	25	3	28	0.90	0.03
9.	DCJC	8	0	8	1.00	0.02
16.	Type Total	(155)	(160)	(491)	(0.32)	(0.31)
10.	Mobil R&D	61	3	64	0.96	0.04
11.	Univ. Comp. Co.	2	0	2	1.00	0.01
12.	Texas Instr.	138	14	152	0.89	0.09
13.	UT SW Med. Sch.	105	295	400	0.26	0.25
14.	SCAS	211	3	214	0.99	0.13
17.	Type Total	(517)	(315)	(832)	(0.62)	(0.51)
	Total	696	908	1,604		

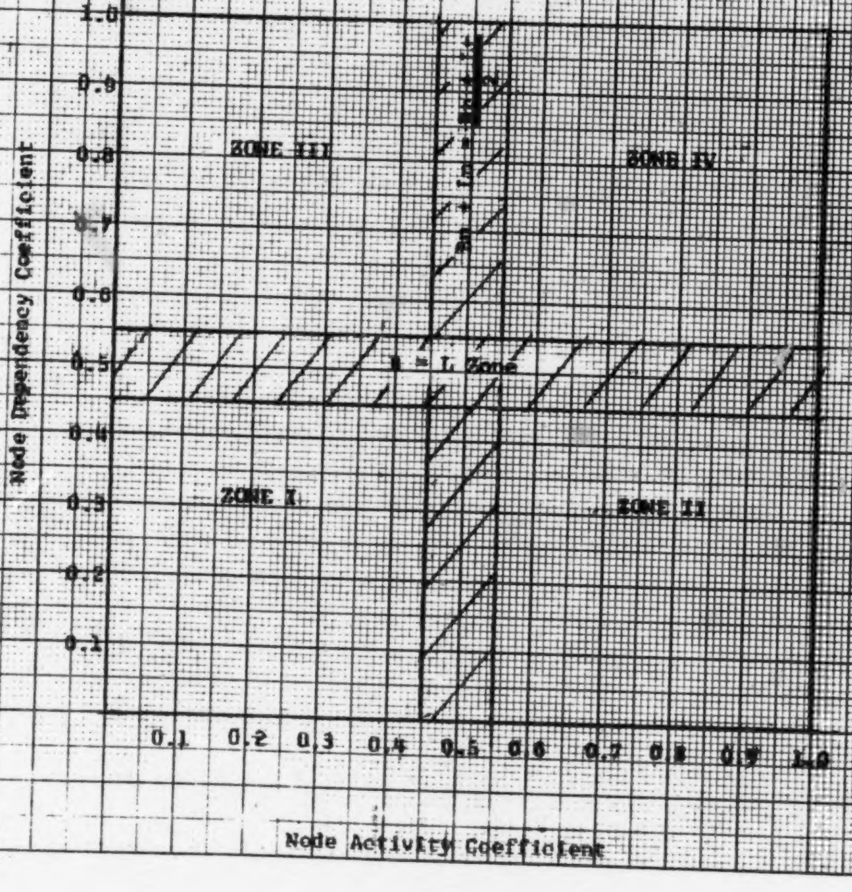
---

* Includes filled and unfilled transactions.

Figure 1

Node/Network Dynamics Grid

Zone I = Low Node Dependency and Low Node Activity
Zone II = Low Node Dependency and High Node Activity
Zone III = High Node Dependency and Low Node Activity
Zone IV = High Node Dependency and High Node Activity



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A. Borrowing Parameters

Table V presents the summary data on the borrowing transactions, reported by the participated libraries. A total of 696 items were requested. By type of library, the borrowing requests originated in the following distribution:

Originating Library Type	Distribution of Borrowing, %
Special	77
Public	4
College & University	19
School	0
Government	0
Other	0

In other words, 77 percent of the borrowing originated from special libraries.

Of the 625 borrowing transactions for which lending source was identified, 52 percent were obtained from libraries within Dallas County, 28 percent from Texas, and 20 percent from out of state.

Of the 631 borrowing transactions for which lending sources by type of library was identified, the following distribution was observed:

Lending Library Type	Distribution of Borrowing, %
Special	15
Public	5
College & University	73
School	0
Government	2
Other	5

In other words, 73 percent of the reported borrowing was filled by college and university libraries.

Comparing type of borrower with type of lender, the following "mix" by library types was observed:

	Type of Borrower:						
Type of Lender:	A	B	C	D	E	F	Total
A) Special	90	2	1	0	0	0	93
B) Public	20	12	2	0	0	0	34
C) College & Univ.	332	6	112	0	0	0	450
D) School	0	0	0	0	0	0	0
E) Government	12	6	0	0	0	0	18
F) Other	35	0	0	0	0	0	35
Total	489	26	115	0	0	0	630

These data indicate that 66 percent of the borrowing transactions involved an exchange between two different types of libraries. The greatest volume of interlibrary transactions occurred between special/academic libraries. Public and academic libraries tend to borrow more from their own type of library. For example, 45 percent of the requests originating from the public libraries were filled by public libraries, whereas only 2 percent of the requests originating from special libraries were filled by special libraries.

Another way of demonstrating the intermixing of borrowing among types of libraries is to show percentage distribution for each of the 12 types of transactions:

Transaction Type	Number of Transactions	% of Transactions
Sp → Sp	90	
Sp → Pub	20	
Sp → Acad	332	52
Sp → Govt	12	
Sp → Other	35	
Pub → Sp	2	
Pub → Pub	12	
Pub → Acad	6	
Pub → Govt	6	
Acad → Sp	1	
Acad → Pub	2	
Acad → Acad	112	19
Total	630	

Regarding the format or communication channel used for the requests of the 613 transactions for which this parameter could be identified, 49 percent were transmitted by telephone, 27 percent by mail, and 21 percent by TWX or Telex. Of the 582 items borrowed by the reporting libraries, 62 percent were obtained on loan and 38 percent by photocopy.

The data on the other borrowing parameters shown in Table II are not sufficiently reliable to interpret.

TABLE V

SUMMARY OF BORROWING BY TYPE OF LIBRARY

	Public	County	State Univ.	Private Univ.	Junior Coll.	Indust.	Medical School	Research Inst.	Total
NO. ITEMS REQUESTED	24	0	72	74	8	201	105	212	696
LOCATION OF LENDER									
In Dallas County	11	0	22	1	2	101	18	175	330
In Texas	5	0	44	18	6	33	56	17	179
Out of State	10	0	5	16	0	34	43	8	116
									625 Total
TYPE OF LENDER									
Special	2	0	0	1	0	14	75	1	93
Public	12	0	1	0	1	19	1	0	34
Coll. & Univ.	6	0	71	34	7	81	41	210	450
School	0	0	0	0	0	0	0	0	0
Government	6	0	0	0	0	8	0	4	18
Other	0	0	0	0	0	35	0	1	36
									631 Total
FORMAT OF REQUEST									
Telex	2	0	0	0	0	0	0	0	2
TWX	0	0	66	6	0	1	36	15	124
ILL Form	13	0	5	12	6	62	64	0	162
Telephone	11	0	0	0	2	111	17	166	307
Letter	0	0	0	0	0	1	0	9	10
Other	0	0	0	0	0	8	0	0	8
									613 Total
NO. REQUESTS REQUIRED	27	0	71	?	10	?	?	?	?
RATIO: REQUESTS / ITEM	27/24	-	1/1	?	10/8	?	?	?	?
ITEMS SUPPLIED BY									
Loan	13	0	23	22	5	63	44	195	365
Photocopy	0	0	23	13	2	85	73	21	217
									582 Total
ITEMS NOT SUPPLIED									
Not in Collection	4	0	10	2	0	?	?	6	22
In Use	2	0	1	1	1	?	?	1	6
Non-Circulating	4	0	6	0	0	?	?	0	10
Other	3	0	3	1	0	?	?	1	7
									451 Total
TIME LAG - DAYS, AVG.									
Request to Receipt	10-30	-	?	5-13	5	?	?	?	?

B. Lending Parameters

Table VI presents the summary data on the lending transactions reported by the participating libraries. A total of 840 items were requested. By type of library, the requests to lend were received in the following distribution:

Type of Library	Number of Requests Received	% of Requests Received
Special	325	38
Public	243	29
College & University	272	33
School	0	0
Government	0	0
Other	0	0
	840	

Of the 840 lending requests received, the reporting libraries were able to fill 530 or 63 percent. The percent of "fills" by type of lending library is shown below:

Type of Library	Requests Received	Requests Filled	% Filled
Special	325	312	96
Public	243	49	21
College & University	272	169	62
School	0	0	0
Government	0	0	0
Other	0	0	0
	840	530	63

Of the 310 items requested but not filled, the reporting libraries gave the following reasons for not being able to fill the requests:

Reason	% of Non-Fills
Not in collection	61
In use	1
Non-circulating	0
Other	38

The geographic location of the requesting libraries as reported by the lending libraries was as follows:

Location	Percent
Dallas County	36
In Texas	61
Out of State	3

The "mix" of transactions between two types of libraries is illustrated in the following table:

	Type of Lender:						
Type of Borrower:	A	B	C	D	E	F	Total
A) Special	249	1	66	0	0	0	316
B) Public	1	235	5	0	0	0	241
C) College & Univ.	63	6	136	0	0	0	205
D) School	0	0	3	0	0	0	3
E) Government	2	1	3	0	0	0	6
F) Other	0	0	1	0	0	0	1
Total	315	243	214	0	0	0	772

The data indicate that only 19 percent of the lending transactions of the reporting libraries involve a mix of two types of libraries. The greatest volume of lending transactions occurred between libraries of the same type. Of these transactions involving two types of libraries, the greatest volume was between special and academic. Of the 36 possible combinations of lending transactions, 14 types were observed in this report. The distribution of these combinations is as follows:

Transaction Type	Number of Transactions	% of Transactions
Sp → Sp	249	32
Sp → Pub	1	
Sp → Acad	66	
Pub → Sp	1	
Pub → Pub	235	30
Pub → Acad	5	
Acad → Sp	63	
Acad → Pub	6	
Acad → Acad	136	17
Sch → Acad	3	
Govt → Sp	2	
Govt → Acad	3	
Other → Acad	1	
	772	

Regarding format or channel by which the lending library received the requests, 27 percent were received by telephone, 21 percent by mail, and 52 percent by Telex or TWX.

Of the 530 items supplied by the lending libraries, 66 percent were delivered as loan items, and 34 percent were sent as photocopies.

TABLE VI

SUMMARY OF LENDING BY TYPE OF LIBRARY

	Public	County	State Univ.	Private Univ.	Junior Coll.	Indust.	Medical School	Research Inst.	Total
NO. ITEMS REQUESTED	240	3	176	96	0	17	305	3	840
SOURCE OF REQUEST									
In Dallas County	34	3	67	19	0	4	171	2	300
In Texas	204	0	107	65	0	10	118	1	505
Out of State	2	0	2	9	0	3	6	0	22
									827 Total
TYPE OF REQUESTER									
Special	1	0	66	0	0	9	238	2	316
Public	232	3	0	5	0	1	0	0	241
College & Univ.	6	0	108	28	0	6	56	1	205
School	0	0	0	3	0	0	0	0	3
Government	1	0	1	2	0	1	1	0	6
Other	0	0	1	0	0	0	0	0	1
									772 Total
FORMAT OF REQUEST									
Telex	189	0	0	0	0	0	0	0	189
TWX	0	0	127	26	0	1	61	0	215
ILL Form	22	0	48	21	0	11	66	1	169
Telephone	29	3	0	7	0	5	165	2	211
Letter	0	0	1	0	0	0	3	0	4
Other	0	0	0	0	0	0	0	0	0
									788 Total
NO. ITEMS SUPPLIED	49	?	76	93	0	14	295	3	530 Total
ITEMS SUPPLIED BY									
Loan	49	?	22	46	0	0	231	2	350
Photocopy	0	?	53	47	0	14	64	1	179
Microform	0	?	1	0	0	0	0	0	1
									530 Total
ITEMS NOT SUPPLIED									
Not in Collection	102	?	83	3	0	1	10	0	199
In Use		?	3	0	0	1	0	0	4
Non-Circulating		?	0	0	0	0	0	0	0
Other	101	?	16	0	0	1	0	0	118
									321 Total

C. Node-Network Dynamics

As discussed in other sections of this report, the methodology for analysis of these data had to be evolved. Although the borrowing data and the lending data individually provide some insight into the interlibrary loan behavior of the participating libraries, these data did not quantify the interlibrary network dynamics believed essential for planning and evaluation.

Thus the Node-Network Dynamics Coefficients discussed earlier were developed in an effort to develop quantitative insight into the pilot model data. The plot of these data on the grid are illustrated in Figure 2 for the total transactions reported (filled and unfilled) by each individual library and by the three types of libraries. With one exception, all the libraries exhibit relatively low node activity (i.e., less than 50 percent of total transactions occurring at a given node). Seven of the libraries exhibit relatively high node dependency with relatively low node activity. Five of the libraries exhibit relatively low node dependency and low node activity.

Figure 3 illustrates these relationships for the refined sample data by the types of libraries.

Based on this analysis methodology, it is possible to identify the relative contribution or dependency of an individual library or a group of libraries in a network organization. The relative location of the individual library on the grid by zone could be used to determine reimbursement formula or pricing of services, as explained previously. Applying this principle to the Dallas Pilot Model data in Figures 2 and 3, those libraries in Zone I should be considered contributing libraries and thus reimbursed for services. Those libraries in Zone III are net users at a relatively low volume of the network and should probably help support the services by some financial means. The libraries in Zone IV are heavy users of the network at high volume and thus should probably provide even greater financial support.

Reviewing geographic sources for borrowing and lending by the participating libraries, the following data are interesting:

Percent Geographic Distribution for:

	Borrowing	Lending
Within Dallas County	52	36
Within Texas	28	61
Out of State	20	3

Figure 2

Node/Network Dynamics of Total Transactions Reported By Individual Library and Type of Library

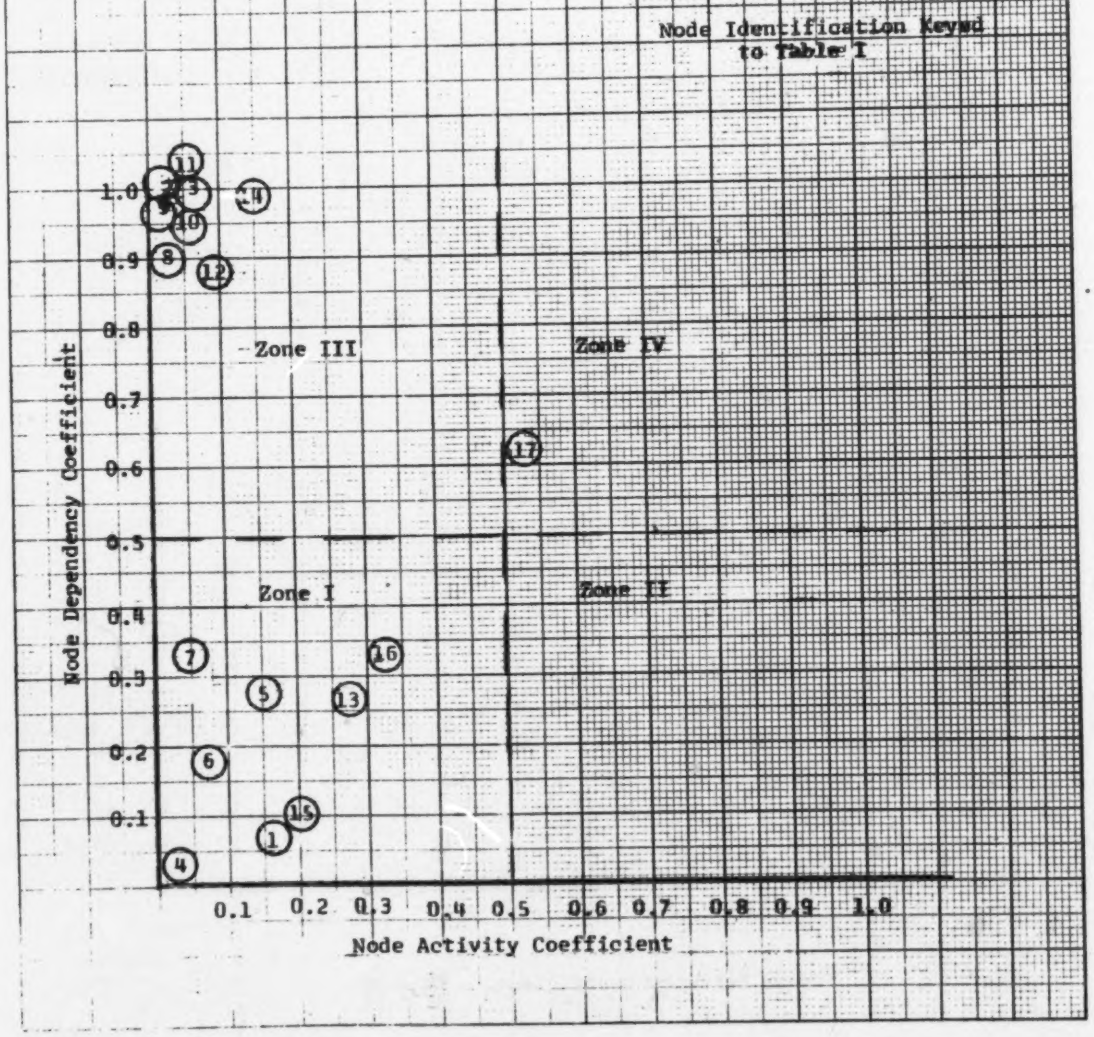
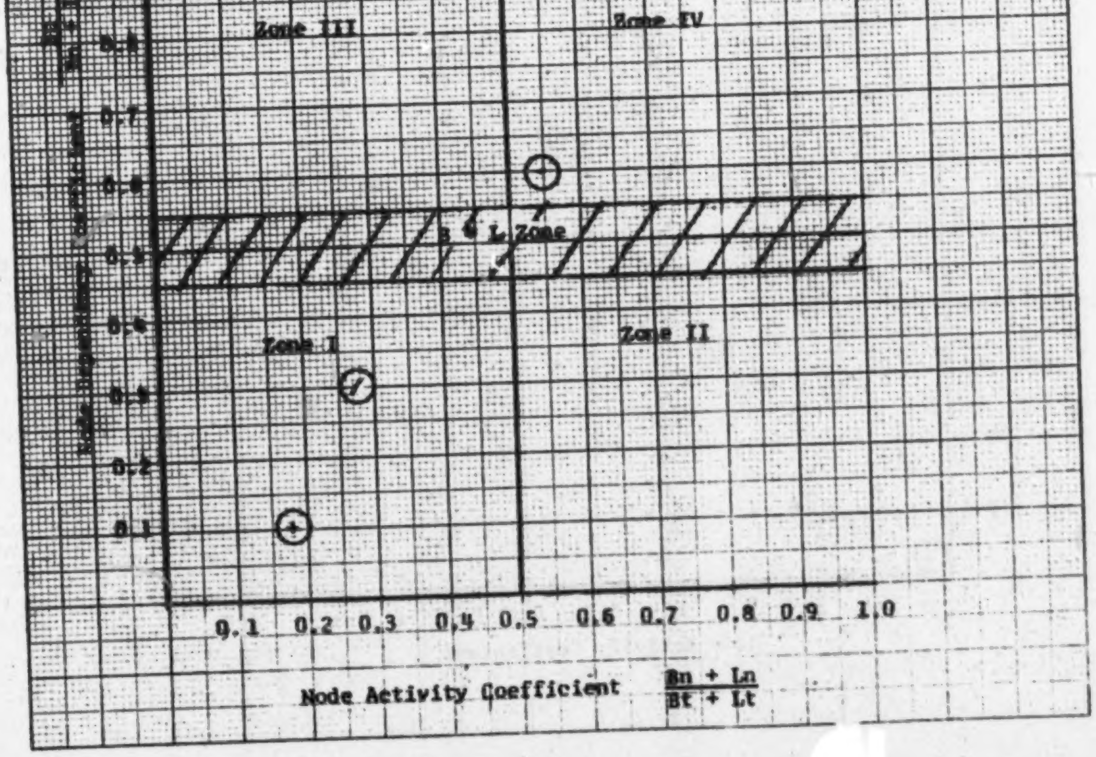


Figure 3

Node/Network Dynamics for Refined Sample



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Reviewing comparative access channels for borrowing and lending, the following data offer some insight into the use of various routes:

Percent Communication Channel Distribution for:

	Borrowing	Lending
Telex	1	24
TWX	20	28
Ill Form	26	21
Telephone	51	27
Letter	1	1
Other	1	-

It should be emphasized that no effort has been made at this stage of the project to compare the findings of the pilot model (Appendix D) with the findings of the behavioral model (Appendix C.6-b). Such a comparison should be made to test the validity of the two methods. The conclusions from the two methods seem to indicate similar network configurations, switching levels, and interdependency of participants, however. Theoretically, each transaction in the pilot model could be reviewed for level of switching, intermixing of library types and success of the transaction.

TABLE VII

CALCULATION OF NODE-NETWORK DYNAMICS COEFFICIENT ON REFINED SAMPLE

Type of Library	Bn	Ln	Bn + Ln	$\frac{Bn}{Bn + Ln}$	$\frac{Bn + Ln}{Bt + Lt}$
Special	489	325	814	0.60	0.55
Public	26	243	269	0.10	0.18
College & Univ.	115	272	387	0.30	0.27
School	0	0	0	-	-
Government	0	0	0	-	-
Other	0	0	0	-	-
Total Sample	630	840	1470	0.44	

Bt + Lt = 1470

APPENDIX E

QUANTITATIVE TECHNIQUES AND LIBRARIES - WHY?*

by Richard E. Nance

By way of introduction, I am not a librarian and therefore probably ill-qualified to answer the question posed by the title of this paper. Yet, I feel that many librarians are either consciously or subconsciously asking this question, and no answers seem to be forthcoming. The purpose of this paper is to offer an answer, or an opinion, in the hope that further discussion will produce the answer. Existence of the answer is neither a necessary condition for the advancement of library science nor a precursor of increased application of quantitative techniques. Perhaps, from an optimistic viewpoint, it will contribute to the former and facilitate the latter.

The Question

- Why are quantitative techniques necessary for the design, evaluation, and/or operation of libraries?
- Why have operations researchers, systems engineers, mathematicians, and statisticians become increasingly interested in libraries?
- Why should librarians concern themselves with the quantitative approaches and those who propound them?

Each of these questions, and several others, is part of the question "Quantitative techniques and libraries - why?" and an answer to the general question must reply necessarily to the more specific ones. I propose an answer which meets this criterion, but recognize that it may fail other equally valid criteria. For this reason, the distinction is made between an answer and the answer.

The Background

Rather than answering the question and following with its substantiation, I offer some background thoughts which lead to the answer. These thoughts are categorized into three topical areas: (1) the information explosion, (2) the advent of computers and computer technology, and (3) the emergence of the library network concept. Discussion of these topics is marked by few references and is abbreviated. The purpose here is to stimulate the reader to document his own agreement or disagreement with the points made.

---

*This work was supported in part by Title III, LSCA Special Project Grant to Industrial Information Services, Southern Methodist University through the Texas State Library.

**The author is indebted to Maryann Duggan for her comments and observations.

The information explosion has been deemed an inappropriate metaphor(12) for the exponential rate of published information in the last two decades. The critic of the term prefers the substitution of "deluge" for "explosion" since the phenomenon did not originate instantaneously, but rather is one of developed momentum. Regardless of the terminology, the problem is apparently, especially to the research librarian. The increase in published scientific journals from 10,000 in 1900 to approximately 100,000 at present attests to this fact(2). This continued surge in published material affects the librarian no less than the researcher. Questions of storage and accessibility become "can it be done?" rather than "how can it best be done?" The former question is one of existence, the latter of optimality. At some point, which may not lie too far into the future for some libraries, the answer to the existence question is "no" without some attention to the optimality question.

Computers and computer technology have influenced the total society in the past decade. Providing additional information media as well as new and revolutionary methods for use of old media, the "machine" has become a spectre looming over the library profession. Leimkuhler's (4, p. 1) observation that "librarians are now in the midst of a revolution that threatens the very foundations of their profession" is an apt one. Fomenting much of this at the primary level is the advent of the computer. One need only look at the research projects of the Institute of Library Research at Berkeley to arrive at this conclusion. Shoffner's(14) description of the efforts of the Institute in 1966 includes explicit references to computers or computer technology in seven of the 12 projects. Leimkuhler and Neville(3) conclude that the future of libraries will reveal the use of mass storage/rapid transfer devices. Licklider(5) foresees the information seeker of the future interacting with the information service in a conversational mode. While some may claim the opinions cited are visionary, each year brings the implausible closer to the realistic. Project INTREX(11), the work of Rubinoff, et.al.(13), among others, reinforce this opinion.

Emergence of the library network concept is the final background factor. In 1963 the Science Advisory Committee recommended the establishment of a network of specialized information centers to alleviate the chaotic conditions in the control of scientific and technical information. The development of highly specialized information centers was a key point in this proposal. This proposal served as a definitive statement of a concept that had evolved in national information services--the topical centralization and geographical decentralization of information. The idea of cooperative sharing is not new to the library profession. Interlibrary loan services have existed for some time, but the network concept demands a more intimate and coordinated relationship among libraries. Conceivably, acquisition, location, processing, and reference policies may require decisions on a total network basis. No longer are decisions of individual libraries or librarians removed from their effects on others. The decision problem is moved into a larger, more variable environment with greater potential for progress or failure.

The Effect

In summary, the background factors cited: (1) the information explosion, (2) the advent of computers and computer technology, and (3) the emergence of the library network concept have produced disturbing consequences. These consequences extend to both the design of library systems and the capabilities demanded of the librarians who administer and use them. Succinctly, the consequences are a many-fold increase in the complexity of library systems and the cost of these systems. Complexity stemming from the exponential growth of published material stimulates the application of computers or the creation of networks. Regardless of which follows first, the computers or the network, the other soon appears since computers are expensive and require a broad base of financial support and networks introduce more complexity, thus increasing the need for judicious computer application.

An Answer

A result of the circular causality relationship among information growth, computer technology, and network structure is the search for the means by which systems of this complexity can be designed, operated, and evaluated. Critical in the design phase, however, is that it requires minimum investment for a fixed utility level or that it derive maximum benefit from a fixed investment level. For this reason the quantitative techniques of operations research or management science have become a useful, if not necessary, tool for library systems design. These techniques and those who practice them have been directed toward problems of acquisition, shelving, circulation, and inventory(2)(6). Recently, the technique of large scale system simulation has been utilized for investigating the effect of library policies and the interaction between policies and the needs of library users(8),(9),(10).

Operations research techniques do not obsolete the librarian nor do they usurp any of his responsibility or authority. The librarian need not become an OR practitioner either. What the techniques do is to enable the librarian to become a more informed decision-maker and to allocate his talents toward areas where quantitative techniques are inappropriate. For example, the accounting and control process of circulation should not demand the continued attention of a professional librarian. Intellectual weeding of the collection must require the attention of a professional. The former task--circulation--can be analyzed quantitatively and even automated. The latter task--intellectual weeding--is beyond the scope of any technique other than the skilled professional librarian.

If librarians are not to become practitioners of OR as I have stated, then why should they be interested in OR? In my opinion today's modern librarian should grasp a basic understanding of what OR can do and what it cannot do. In this regard, the book by Morse(14) takes a long first step. Correspondingly, the OR practitioners need to become more knowledgeable of the many complicated functions involved in the administration of a modern library. Progress rests on the degree to which the library professionals and the OR practitioners communicate and exchange understanding. I, for one, am optimistic.

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APPENDIX F

LIBRARY NETWORK ANALYSIS AND PLANNING (LIB-NAT)

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LIBRARY NETWORK ANALYSIS AND PLANNING (LIB-NAT)

Maryann DUGGAN: Director, Industrial Information Services Program, Southern Methodist University, Dallas, Texas

A preliminary report on planning for network design undertaken by the Reference Round Table of the Texas Library Association and the State Advisory Council to Library Services and Construction Act Title III Texas Program. Necessary components of a network are discussed, and network transactions of eighteen Dallas area libraries analyzed using a methodology and quantitative measures developed for this project.

To be a librarian in 1969 is to stand at the crossroads of change, with a real opportunity to put libraries and professional experience to work on immediate problems of today's world. In mobilizing total library resources for effective service to a variety of patron groups in a variety of ways, the librarian has at hand an exciting new tool of great potential and equally great challenge: the library network.

LIBRARY NETWORKS AND REFERENCE SERVICES

Networks and all that they imply are simply an extension of good reference services as they have been practiced for years, but their existence and potential capability require redefinition of the reference function, which, being no longer limited to one collection, has been given new dimensions of time, depth and breadth.

Networks, and the inter-library cooperation they require, offer an opportunity to combine materials, services and expertise in order to achieve more than any one library can do alone. In this case, the whole is greater than the sum of its parts, for each library can offer its particular patron group the total capability of the network, including outside resources not previously available.

The basic philosophy back of Lib-NAT is simply that any person anywhere in the State of Texas should have access to any material in any library anywhere in the State through a planned, orderly, effective system that will preserve the autonomy of each library while serving the needs of all the citizens of the State. Particular needs of special user groups (such as the blind or the accelerated student or the industrial researcher) should also be identified and provided for in a cooperative mode through local libraries throughout the State.

NETWORK COMPONENTS

In the process of developing Lib-NAT, twelve critical components were identified that are essential to orderly, planned development of the objectives stated above. As a minimum, such a network must have the following:

1) Organizational structure that provides for fiscal and legal responsibility, planning, and policy formulation. It must require commitment, operational agreement and common purpose.
2) Collaborative development of resources, including provision for cooperative acquisition of rare and research material and for strengthening local resources for recurrently used material. The development of multi-media resources is essential.
3) Identification of nodes that provide for designation of role specialization as well as for geographic configuration.
4) Identification of primary patron groups and provision for assignment of responsibility for library service to all citizens within the network.
5) Identification of levels of service that provide for basic needs of patron groups as well as special needs, and distribution of each service type among the nodes. There must be provision for "referral" as well as "relay" and for "document" as well as "information" transfer.
6) Establishment of a bi-directional communication system that provides "conversational mode" format and is designed to carry the desired message/document load at each level of operation.
7) Common standard message codes that provide for understanding among the nodes on the network.
8) A central bibliographic record that provides for location of needed items within the network.
9) Switching capability that provides for interfacing with other networks and determines the optimum communication path within the network.
10) Selective criteria of network function, i. e., guidelines of what is to be placed on the network.
11) Evaluation criteria and procedures to provide feedback from users and operators and means for network evaluation and modification to meet specified operational utility.

12) Training programs to provide instruction to users and operators of the system, including instruction in policy and procedures.

The foregoing components of the ideal inter-library network (one so designed that any citizen anywhere in the state can have access to the total library and information resources of the state through his local library) may be considered the conceptual model, or the floor plan from which the network of the program can be constructed. Although these twelve components might be labeled "ideal," they are achievable and they are within reach of the present capability of all libraries today. They have also weathered the unrelenting critique of 288 reference librarians in the March 27, 1969, TLA Reference Round Table ("The 1969 Reference Round Table Pre-Conference Institute: An Overview," *Texas Library Journal*, Vol. 45 (Summer 1969), No. 2.). During that Reference Round Table the twelve components were tested in a simulated network, using 42 cases. In this behavioral model actual, current inter-library practices were observed during game-playing in the simulated network. The experience verified that the components outlined above are essential to the development of planned, cooperative, inter-library systems.

ANALYSIS OF NETWORK TRANSACTIONS

As part of the LSCA Title III project, and to test the twelve components, exploration was instituted into the existing inter-library relations among eighteen libraries of all types in the Dallas area to see how current practices compared with the ideal conceptual model. The essential minimum requirement of a library is document transfer, i. e., the ability to supply a known item on request; and on-going inter-library loan transactions are a valid indicator of emerging network patterns in the current environment.

This microscopic study of 1967 individual library loans among eighteen libraries of different types has provided a wealth of insight into network developments. As a pilot model it has offered a means of observing and studying existing practices, identifying problems, and experimentally evaluating the effect of changes in the system or environment. More must be known about on-going inter-library transactions for the design of improved networks. In the attempt to find out who was attempting to borrow what from whom and how successfully requests were filled, the following variables were considered:

1) Type of library, both borrowing and lending, such as academic, public, special, or public school.
2) Type of message format, i. e., telephone, TWX, TELEX, letter, or interlibrary loan.
3) Type of item requested in the transaction, such as monograph, serial, map, document.
4) Geographic location of borrowing and lending library, i. e., local, area, state, regional, national or international.

The complexity of even a small pilot model required the formulation of some rigor in the analysis and the development of analytical tools and symbolic models. Figure 1, for example, is a symbolic model that permits comparison of two variables simultaneously, e. g., the type of library participating in the transactions and the geographic level of the participants. For modeling purposes, it was assumed all libraries fall into one of four

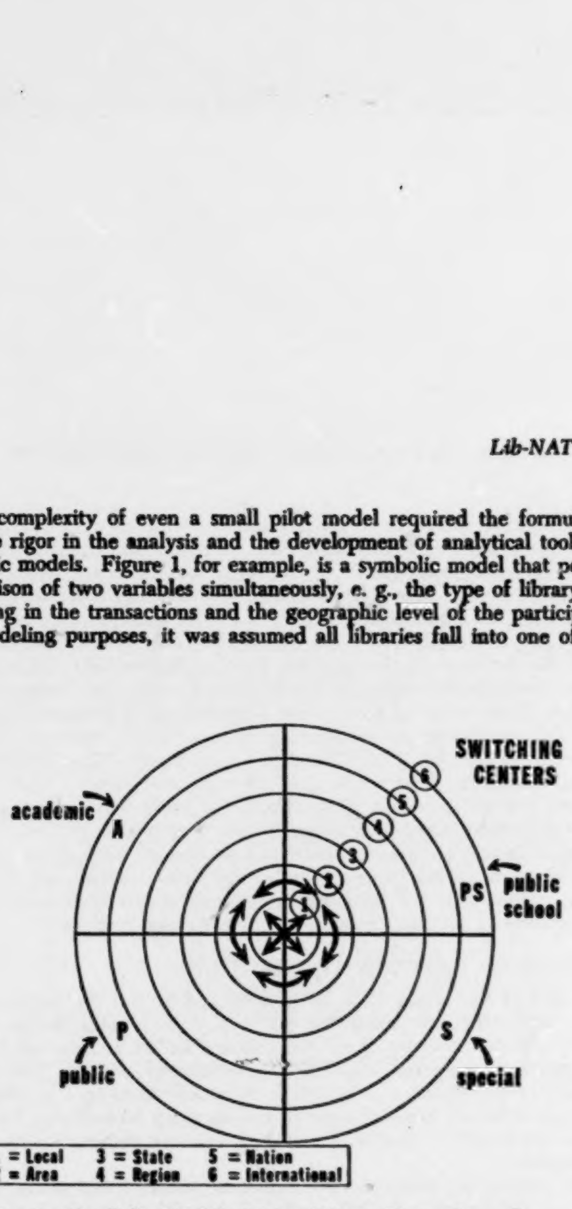


Fig. 1. Symbolic Model of Inter-Library Networks.

classes represented by the quadrants in Figure 1. Also it was assumed that each library can be identified as to a specific geographic level, as indicated by the numbers 1 through 6. In the analysis of the pilot model data it was observed that transactions occur among libraries of the same type and at the same geographic level, and between libraries of different types at different geographic levels. Figure 1 provides a symbolic model for conceptualizing these various types of transactions. Switching centers, represented on Figure 1 by the circles around the geographic numbers, participate in transactions at varying geographic levels, as well as between and among various types of library sectors. The role and the location of switching centers is an important aspect of Lib-NAT.

Within the framework of the symbolic model, the simple form of interlibrary loan may be represented as a two-body transaction between the borrowing library and the lending library, as shown in Figure 2. Applying these transactions on the symbolic model of Figure 1 and considering both type of library and geographic level, four general classes of two-body transactions can be identified:

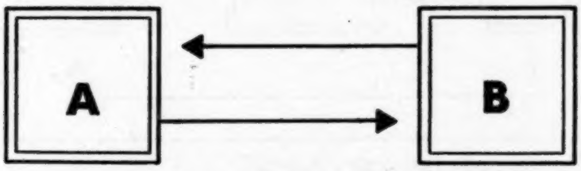


Fig. 2. Two-Body Transaction.

1) Homogeneous vertical, i. e., between two libraries of the same type but at different geographic levels ($P_1 \rightarrow P_4$; $S_1 \rightarrow S_3$);
2) Heterogeneous horizontal, i. e., between two different types of libraries at different levels ($P_1 \rightarrow A_1$; $S_1 \rightarrow P_1$);
3) Heterogeneous vertical, i. e., between two different types of libaries at different levels ($P_1 \rightarrow A_4$; $S_1 \rightarrow P_3$);
4) Homogeneous horizontal, i.e., between two libraries of the same type and the same geographic level ($P_1 \rightarrow P_1$; $S_2 \rightarrow S_2$).

The formulas serve as a shorthand symbolic representations of some typical transactions of these four classes. The final report on Lib-NAT will contain statistical data on distribution of pilot model transactions by type and by geographic level, showing type interdependency and geographic dependency or self-sufficiency.

Further analysis of the pilot model data revealed another type of transaction, the three-body transaction, in which a third agent becomes involved. The third agent may act as a referral center, as illustrated in Figure 3, or as a relay center, as illustrated in Figure 4 (SW indicates switching center). Part of the Lib-NAT theory specifies that there is a distinction between referral and relay, and that the latter is a valid function of a true switching center. Figure 5 illustrates the various types of possible three-body transactions with different geographic levels of switching among the different types of libraries. Which of these transactions is the most efficient or has the greatest utility is one of the basic design parameters needing further analysis. It should be noted that the variable of message format, that is, the channel of communication or type of communication link, has not yet been investigated in the symbolic modeling of these transactions.

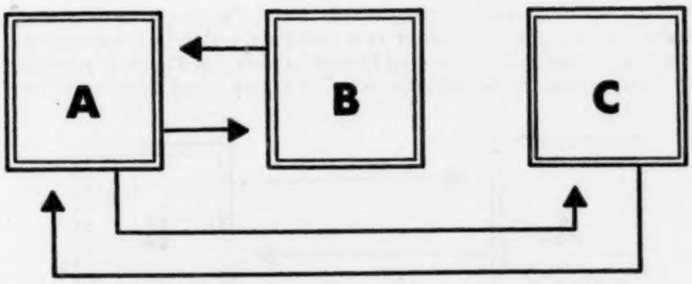


Fig. 3. Three-Body Transaction: Referral.

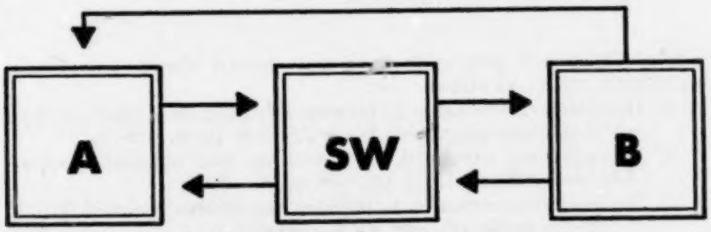


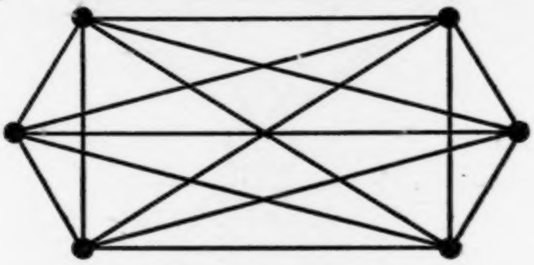
Fig. 4. Three-Body Transaction: Relay.

$$A_1 \rightarrow SW_1 \rightarrow S_1$$
$$A_1 \rightarrow SW_5 \rightarrow A_4$$
$$P_5 \rightarrow SW_5 \rightarrow P_1$$
$$SC_1 \rightarrow SW_2 \rightarrow SC_2$$
$$P_2 \rightarrow P_1 \rightarrow SW_3 \rightarrow P_3$$
$$P_2 \rightarrow P_1 \rightarrow SW_3 \rightarrow A_3$$
$$P_2 \rightarrow P_1 \rightarrow SW_3 \rightarrow SW_1 \rightarrow S_1$$

Fig. 5. Three-Body Transactions at Various Geographic Levels.

NETWORK CONFIGURATION

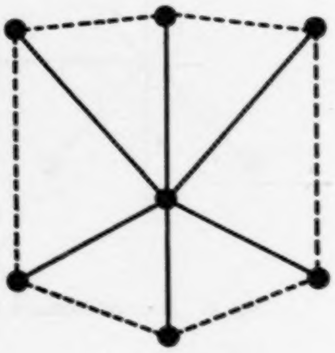
Another very important design parameter is the network configuration or organizational hierarchy specifying the communication channels and message flow pattern. Figure 6 illustrates symbolically a non-directed configuration of communication. If each dot represents a node in the network (i. e., a participating library), and each line represents a communication link, it can be seen that each node can communicate directly with every other node, providing (or requiring) a total of fifteen links among the six nodes.



$$\boxed{C = N\left(\frac{N-1}{2}\right) = 15}$$

Fig. 6. Non-Directed Network.

By contrast, Figure 7 illustrates a directed configuration to which the six nodes are interconnected through a switching center and requiring only six channel links. In like manner, if a non-directed network desires to interface with a specialized center, such as the Library of Congress or a special bibliographic center or search center, a total of twenty-one channels is required (Figure 8), whereas a directed network can interface with a specialized center via only seven channels, as illustrated in Figure 9.



$$\boxed{C = N - 1 = 6}$$

Fig. 7. Directed Network.

With the new tool of library networks, it is possible to provide responsive, personalized, in-depth reference service, and to provide it so rapidly that a patron can receive a pertinent bibliography covering his desired topic within an hour of his original inquiry. The reference librarian becomes an expert in resources and resource availability at the national level. His reference desk becomes a switching center, at which he receives and analyzes inquiries, decides the level of service required, identifies available sources or resources that match an inquiry, transmits the latter (restructured to be compatible with the network language), conducts a dialog with the source, receives the response and interprets it to the patron. This procedure is not markedly different from what has been done for years in any reference library, but with greater potential the process must be more formalized and structured.

Networks do require new expertise and crystallizing the reference philosophy. Clarification is needed as to 1) types or levels of reference services, and unit operations in reference services; 2) the role of in-depth subject analysis of reference queries; 3) decisions on alternate choices of sources and of communications links; 4) structuring of large blocks of resources to permit fast access; and 5) the role of each library in the network and its responsibility to the network.

APPROACH TO NETWORK DESIGN

The Reference Round Table of the Texas Library Association and the State Advisory Council to Library Services and Construction Act Title III Texas Program have been struggling with the challenge of inter-library network design for the past two years. This paper is written to share with reference librarians some of their preliminary findings and to urge the involvement of reference librarians in planning and developing networks and network parameters. For identification the project herein described is referred to as Lib-NAT, for Library Network Analysis Theory.

Although only the author can be blamed for any faults of this "theory," many persons have contributed to the development of it. The Reference Round Table of the Texas Library Association has provided the forum for exploring and developing ideas on inter-library cooperation. Title III of the Library Services and Construction Act has provided the legal and financial impetus enabling the field testing of some of those ideas. Texas Chapter, Special Libraries Association, has sparked and catalyzed ideas and clarified needs. The State Technical Services Act provided the vehicle for experimental development of new approaches to reference services. Southern Methodist University provided the haven and ivory tower from which these new approaches could be tried under the cloak of academic respectability. But, of greatest importance of all, individual librarians, with vision and desire to be of service and willingness to try new things, have been the driving force in helping to develop new concepts of library use and purpose in the Texas area.

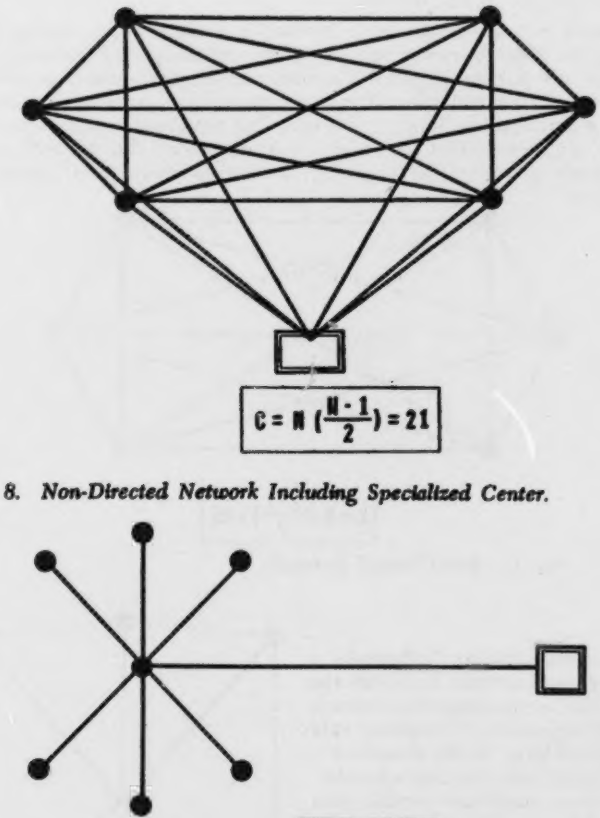


Fig. 8. Non-Directed Network Including Specialized Center.

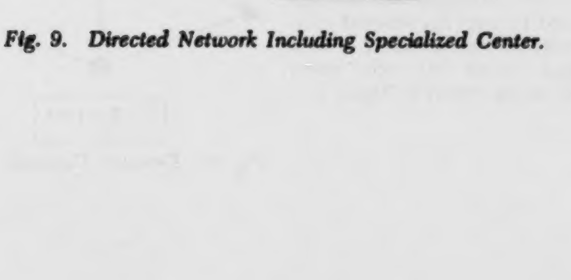
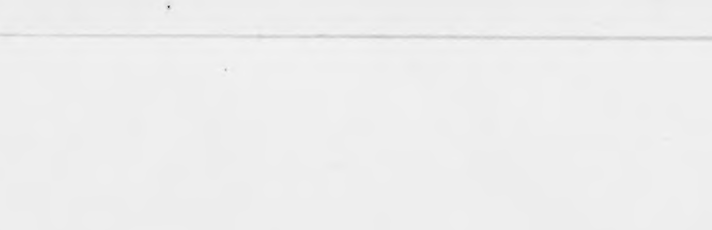


Fig. 9. Directed Network Including Specialized Center.

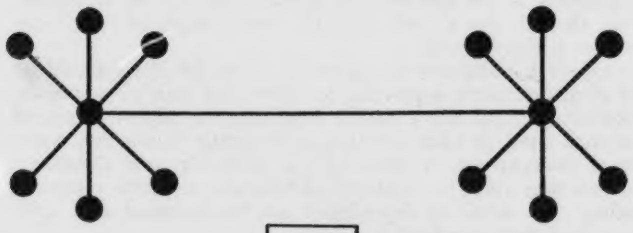
As local or area networks begin to develop, there will be a need for tying together two area networks to develop larger units of service. The interfacing of an original network of six libraries in one area with an adjoining area network of six libraries will result in the network configuration shown in Figure 10 in the case of a non-directed network, and sixty-six communication links among twelve nodes will be required. Whereas, if two directed networks of six libraries each desire to interface, a type of linkage requiring only thirteen channels may be envisioned (Figure 11).

Which is the best type of network configuration? What are the decision parameters that should be considered in designing or planning network configuration? How can alternate configurations be evaluated? Alternate channel requirements? And alternate geographic levels of switching? In the pilot model study, a mathematical model has been devised which can be used for simulating various configurations and channel capacities,



$$\boxed{C = 12\ \left(\frac{12-1}{2}\right) = 66}$$

Fig. 10. Interface of Two Non-Directed Networks.



$$\boxed{C = 13}$$

Fig. 11. Interface of Two Directed Networks.

thereby permitting some desired criteria function of network performance to be maximized or optimized. The details of the mathematical model will be published as part of the final report on Lib-NAT; in the meantime it can be said that this is a fascinating area of network analysis which will be useful to any group of libraries planning network configurations. The mathematical model—a multi-commodity, multi-channel, capacitated network model, developed by Dr. Richard Nance at Southern Methodist University as part of the Title III project—promises to have a high potential application in network design and performance evaluation. It does require that the librarian make some hard-nosed decisions on operational and performance parameters of the inter-library systems discussed in the preceding article, but this is part of the challenge of Lib-NAT.

MEASURES OF PARTICIPATION

It is obvious that types of libraries, geographic level, types of transactions, various network configurations, alternate communication links and switching levels are all important in planning inter-library systems. Next it is necessary to take an in-depth look at the relationship between the individual participating library and the total network. In the pilot model study of eighteen libraries a noticeable difference appeared in the magnitude and type of participation. In surveying only the two-body transactions, it was observed that some libraries were primarily borrowers and others primarily lenders, and some were heavy and some light. In pursuit of a quantitative method of representing these relationships some formulae were evolved which are helpful in understanding node/network dynamics.

Starting with the individual library or node, let B_n equal the number of borrowing transactions originating at that node and L_n equal the number of lending transactions; then L_n plus B_n will equal the total number of all transactions at that particular node.

In like manner, looking at the total network (in this case all eighteen participating libraries), let B_t equal the total number of borrowing transactions originating in the network and L_t the total number of lending transactions; then B_t plus L_t will equal the total number of both types of transactions in the network.

In the analysis of node/network dynamics, it was felt there should be some way of quantitatively expressing the individual node's dependency on the total network and also a way of expressing the relative degree of activity of each node. In other words, a participating library that was a net borrower (compared to its lending) was obviously more dependent on the network than would be a library that borrowed very little compared to its lending. The extent of dependency can be expressed as a node dependency coefficient calculated as follows:

$$\frac{B_n}{B_n + L_n} = \begin{array}{l}\text{Relative amount of}\\ \text{borrowing compared to}\\ \text{total node transactions}\end{array}$$

Among its other uses, the dependency coefficient of a node may give some insight into the extent to which it should share in network expenses, but the dependency coefficient alone should not be a final criterion, since magnitude of activity is of equal importance. For developing a method of quantitatively expressing activity of a node compared to total activity of the network a factor called the node activity coefficient may be calculated as follows:

$$\frac{B_n + L_n}{B_t + L_t} = \text{Relative activity of both types at one node compared to total activity in total network}$$

Then, to quantitatively express the dependency of a given node on the network, one can calculate the node/network dependency coefficient as follows:

$$\frac{B_n}{B_t + L_t}$$

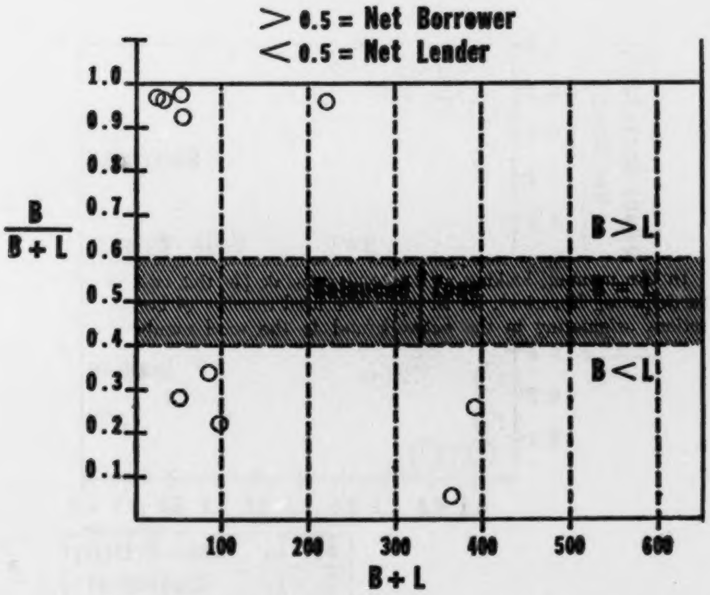


Fig. 12. Node Dependency Coefficient.

Figure 12 illustrates one use of the data points expressed above. Plotting the node dependency coefficient versus the total transactions at the nodes readily reveals the differences in the relationships between them and the network. What the relationship should be is a value judgment that is open to conjecture, but if it is assumed that theoretically each node should be in some sort of balance between borrowing and lending, it is possible to construct a balance zone based on ten percent leeway from perfect balance. By zoning various levels of activity vertically, one can develop a quantitative grid for comparing network participants' activity, both give and take, and can possibly arrive at a funding structure for network financing. The dots in Figure 12 illustrate data points from the pilot model.

Figure 13 shows another application of quantitative data on node/network relationships. By plotting the node dependency coefficient on the left and the node activity coefficient on the lower axis, one can see individual differences easily and readily compare relative participation. Certainly, a node with a 1-1 plot is more dependent on the network than a node with an 0.1-0.1 plot.

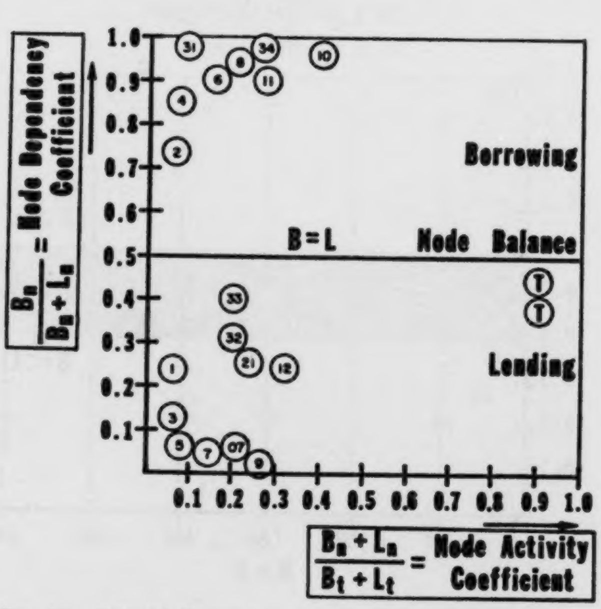


Fig. 13. Network Dynamics.

NETWORK PERFORMANCE

In evaluating the performance of a network there are three key factors to consider: 1) turn-around time, meaning the time required to complete a transaction or satisfy a request; 2) the cost of completing the transaction or satisfying the request, including fixed and variable cost; and 3) quality, the all-important criterion of how well the job is done, based on patron satisfaction or other standards. These three factors are interrelated but can be quantitatively identified, as illustrated schematically in Figure 14.

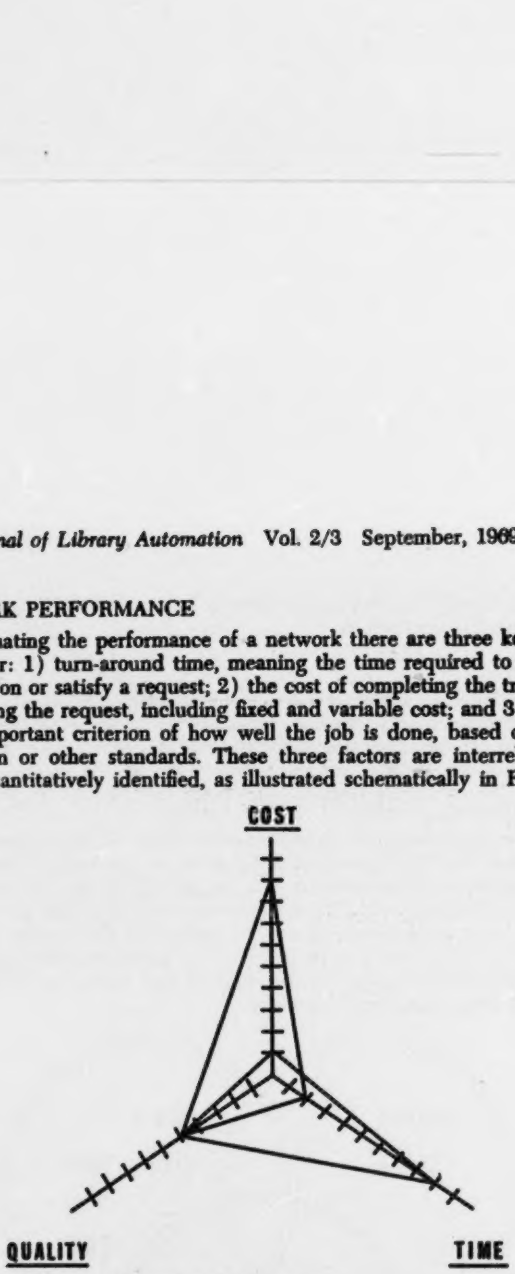


Fig. 14. Network Utility Factors.

It may be seen here that one network might demonstrate average quality, high cost and fast time, whereas another network might demonstrate average quality, low cost and slow time. It is suggested that this technique of interrelating time, cost and quality is useful in evaluating and comparing network performance. Certainly it is necessary to consider all three factors in defining network utility and network operational parameters.

The several methodologies described above were used to analyze the performance of the eighteen libraries participating in the study. Preliminary results are disturbing. For example, the range of unfilled requests was from 76 percent in public libraries to 2.5 percent in medical libraries, for an average of 23 percent. Node dependency coefficient ranged from 1.0 in junior colleges and 0.97 in industrial libraries to a low of 0.27 in medical libraries. The range in activity coefficient was from zero in county libraries to 0.2 in medical libraries. It is to be hoped that further analysis will provide insight into ways of improving services and evolving performance standards for networks.

SUMMARY

The Lib-NAT approach provides a methodology for looking at inter-library cooperation and network design. Some of the quantitative tools offered may not be applicable to every situation; some of the hypotheses may prove to be in error, but the ultimate goal of the exercise is to improve services to users. Thus the last point in Lib-NAT is probably of greatest significance to all.

In it one may recognize an old rule of thumb in book selection: the right book to the right person at the right time. Looking at the heart of network performance as illustrated in Figure 15, it can be seen that a system is performing "right" when there is a match of the patron group (a) with the library type (b) and the nature of the request (c). The combination of the three may be called a "hit" and is of utmost importance in determining what to put on the network and where to direct the request, and what to seek and for whom.

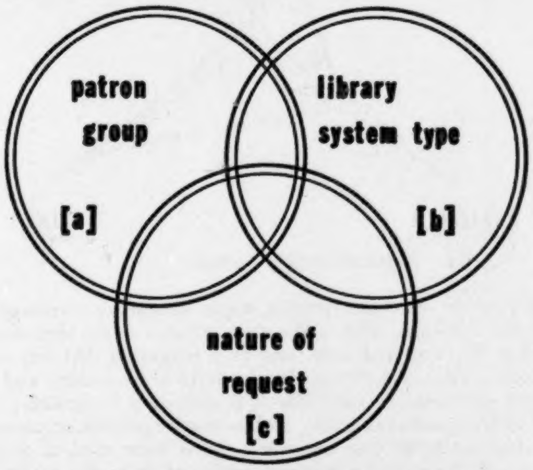


Fig. 15. Parameters of Network Selectivity Policy.

Librarians are just beginning to understand that inter-library networks offer not only a great potential to improve and expand services, but a whole new dimension in reference services as well. The purpose of Lib-NAT is to help formulate the rules of this new "ball game."

NOTE

The final report on this project will include the full script of the Reference Round Table networking game; a glossary of networking terms; the computer programs for computing and graphing inter-library network coefficients; and the details of the operations research model of library networks. A copy of the final report on Lib-NAT may be had after September 15, 1969, from Mrs. Marie Shultz, Texas State Library, Austin, Texas, or from the author.

ACKNOWLEDGMENTS

Miss Janice Kee, Regional Program Officer, Office of Education, Dallas, Texas, provided encouragement and critical insight. Mrs. Marie Schultz, Head of Field Services Division, Texas State Library, Austin, supported the project as part of the Texas State Plan under LSCA Title III.

Dr. Richard Nance, Professor, Institute of Technology, SMU, and Mr. Carl Peters, Programmer, Southwest Center for Advanced Studies, Dallas, contributed mathematical and programming skills. The figures were prepared with the assistance of Mrs. Mickey Boyvey, Library Coordinator, Texas Education Agency, Austin, Texas.

The author wishes to express particular appreciation to the eighteen librarians who collected the data on interlibrary transactions and assisted in the planning of the pilot model.

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APPENDIX G

ACTUAL COST OF THE PROJECT AS OF JUNE 30, 1969

Salaries	$ 7,245.52
Fringe Benefits	700.00
Consultants	4,050.00
Committees, Workshops	4,783.10
Travel	1,415.78
Communications Cost	198.16
Supplies and Printing	3,963.25
Rent/Purchase Equipment	145.00
Indirect Costs	1,000.00
	$ 23,500.81

Since June 30, 1969, approximately $5,000 in costs have been contributed in labor to complete this final report.